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USAF BIOENVIRONMENTAL NOISE DATA HANDBOOK. VOLUME 80. A-7D AIRC--ETC(U)
FEB 77 R G POWELL

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Volume 80

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USAF BIOENVIRONMENTAL NOISE DATA HANDBOOK

Volume 80.

A-7D Aircraft, Near and Far-Field Noise

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10 Robert G. / Powell

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AEROSPACE MEDICAL RESEARCH LABORATORY
AEROSPACE MEDICAL DIVISION
AIR FORCE SYSTEMS COMMAND
WRIGHT-PATTERSON AIR FORCE BASE, OHIO 45433

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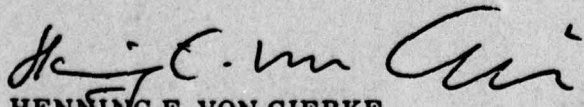
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FOR THE COMMANDER


HENNING E. VON GIERKE
Director

Biodynamics and Bionics Division
Aerospace Medical Research Laboratory

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for total daily exposure of personnel with and without standard Air Force ear protectors. Far-field data measured at 19 locations are normalized to standard meteorological conditions and extrapolated from 75-8000 meters to derive sets of equal-value contours for these same seven acoustic measures as functions of angle and distances from the source. Refer to Volume 1 of this handbook, "USAF Bioenvironmental Noise Data Handbook, Vol 1: Organization, Content and Application", AMRL-TR-75-50(1) 1975, for discussion of the objective and design of the handbook, the types of data presented, measurement procedures, instrumentation, data processing definitions of quantities, symbols, equations, applications, limitations, etc. ↑

PREFACE

This report was prepared by the Biodynamic Environment Branch, Aerospace Medical Research Laboratory, under Project/Task 723104, Measurement and Prediction of Noise Environments of Air Force Operations.

The author gratefully acknowledges Mr. John Cole for his assistance in preparing this report, Col Justus Rose and Mr. Robert England for their assistance in acquiring the raw data, Mr. Keith Kettler, Mr. Henry Mohlman and Mr. David Eilerman of the University of Dayton for assistance in the mechanics of data processing, and Mrs. Norma Peachey and Mr. Mike Patterson for assistance in typing and preparation of the graphics.

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INTRODUCTION

The USAF A-7D is a close support aircraft powered by a TF41-A1 turbofan engine. The aircraft was manufactured by the LTV Aerospace Corporation and the engine by the Allison Division of the General Motors Corporation.

This volume provides measured and extrapolated data defining bioacoustic environments produced by this aircraft during ground runup operations. Such data are essential to evaluate ear protection requirements, limiting personnel exposure times, voice communication capabilities, and annoyance problems associated with ground runups of the A-7D aircraft.

This volume is one of a series published by the Aerospace Medical Research Laboratory (AMRL) under the same report number (AMRL-TR-75-50) as a multi-volume handbook that quantifies the noise environments produced at flight/ground crew locations and in surrounding communities by operations of Air Force aircraft and ground support equipment. The far-field, community-type, noise data in the handbook describe the noise produced during *ground operations* of aircraft, ground support equipment, and other ground-based equipment or facilities.

Volume 1 of this handbook discusses the objectives and design of the handbook, the types of data presented, measurement procedures, instrumentation, data processing, definitions of quantities, symbols, equations, applications, limitations, etc. Volume 2 provides a method and data for adjusting the handbook's far-field noise data, which are for standard meteorological conditions (15°C temperature, 70% rel humidity, 0.760 meters Hg barometric pressure), to derive comparable data for other meteorological conditions. Refer to *Volumes 1 and 2* (references 2 and 3) for such information because it is not repeated in other handbook volumes.

A cumulative index lists those aerospace systems contained in the handbook, and identifies the specific volumes containing each type of environmental noise data available (i.e., inflight/flight crew and passenger noise, near-field/ground crew noise, far-field/community noise). Volume numbers are assigned sequentially as individual volumes are published. This index is periodically updated as individual volumes are published and is available upon request from AMRL/BBE, Wright-Patterson AFB, OH 45433. Organizations on the distribution list for the handbook will automatically receive a copy of each updated index.

Direct any questions concerning the technical data in this report and other handbook volumes to: AMRL/BBE, Wright-Patterson AFB, OH 45433; AUTOVON 78-53675 or 78-53664; Commercial (513) 255-3675 or (513) 255-3664.

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1. Cole, John N., *USAF Bioenvironmental Noise Data Handbook Volume 1: Organization, Content and Application*, AMRL-TR-75-50 (1), Aerospace Medical Research Laboratory, Wright-Patterson Air Force Base, Ohio, 1975.
 2. Cole, John N., *USAF Bioenvironmental Noise Data Handbook, Volume 2: Procedure to Evaluate Effects of Non-standard Meteorological Conditions on Far-Field Noise*, AMRL-TR-75-50 (2), AMRL, WPAFB, OH, 1975.

NEAR-FIELD NOISE

MEASUREMENTS

AMRL acquired near-field noise data on the A-7D aircraft during ground runup operations of its turbofan engine. For these tests the aircraft was located on a concrete runup pad at Eglin AFB with no significant reflecting surfaces in the vicinity except the ground plane. Table 1 gives the surface meteorological conditions and the three engine/power conditions. The ground-crew chief selected power conditions and near-field locations generally used during routine maintenance or engine runup for preflight checks.

At each near-field location a test engineer randomly moved a hand-held microphone in and around each location, probing all areas where a crew member's head would normally be located. He recorded all the noise samples on magnetic tape. During analysis of each sample, he determined the octave band root-mean-square sound pressure 4- or 8-second integration time to derive a power-averaged level for each location. Figure 1 shows the four near-field locations where ground crews are usually located for maintenance and/or preflight checkout operations. Estimates of noise levels at other locations are difficult in the near-field since the noise source is spatially distributed i.e., not a point source. The noise levels at near-field locations can vary widely depending upon relative distances from each noise source (intake noise, exhaust noise, panel resonances, internal engine noise through the engine wall, etc).

Table 1 lists the numeric/alphabetic designators used on the data pages in this report to identify the measurement locations and test conditions. For example, the designator 1/A means ground crew location 1 and test condition A.

RESULTS

The measured data presented in Table 2 define the sound pressure levels (SPL) produced by the A-7D aircraft at the four ground crew locations. This table includes the overall, 1/3 octave band, and octave band levels. From these data one can calculate the variety of measures given in Table 3, which are widely used to assess the effects of noise on personnel and their performance.

All near-field data are for the meteorological conditions at the time of test but are valid for all typical airbase meteorology because of the short sound propagation distances involved.

TABLE 1
MEASUREMENT LOCATIONS AND TEST CONDITIONS
FOR NEAR-FIELD NOISE MEASUREMENTS

A-7D Aircraft, Ground Runup, Eglin AFB
 11 Aug 71
 Tail # 88221

Ground Crew Location

1	Engine Start, Fire Guard
2	Wheel Chock Pull
3	Pin Pull
4	Engine Trim Panel

Aircraft Engine Operation

A	Idle
B	85% RPM
C	Intermediate (Military) Power

Meteorology

Temperature	26.7 C
Bar Pressure	0.758 M Hg
Rel Humidity	83 %
Wind — Speed	2.1 M/Sec (4 kt)
— Direction	320 Deg

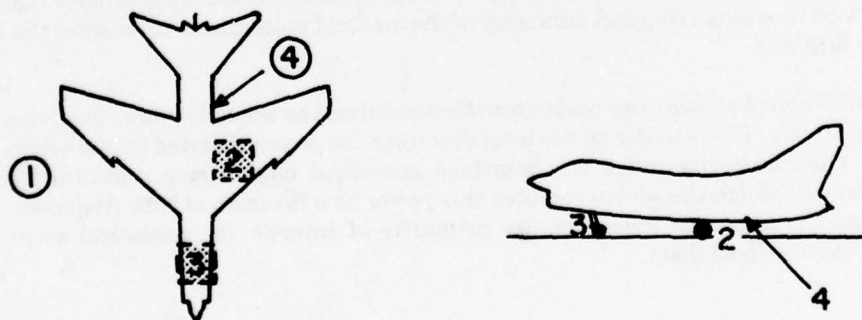


Figure 1. Near-Field Measurement Locations at Trim Pad
Eglin AFB FL

FAR-FIELD NOISE

MEASUREMENTS

AMRL acquired far-field data during 1-hour test periods at both Edwards and Eglin AF bases. Figure 2 shows the ground runup pads, ground cover, aircraft orientation and the 19 microphone measurement sites on each semicircle. The centers of the 75 meter radius semicircles used in surveying the TF41-A1 engines were on the ground directly below the intersection of the aircraft's centerline and the plane passing through the engine's exhaust-nozzle exit. The ground runup pads did not have blast deflectors; therefore, the jet exhausts were in a "free-flow" condition.

Table 4 provides cockpit readouts of some engines characteristics (% RPM, fuel flow, etc.) for each power setting used in the far-field tests. Also listed in this table are the surface meteorological conditions during data acquisition.

All microphone measurement sites are in the acoustic far-field of the source where the sound wavefronts spherically diverge and the noise source may be regarded as a point source.

Test personnel acquired far-field noise data at Eglin AFB by using a hand-held microphone (1.7 meters/5½ feet above the ground plane and pointed at the noise source, 0° incidence) and sequentially recording 5-10 seconds of data at each far-field location on a portable microphone/tape recorder system.

A similar microphone/tape-recorder system was used to sequentially record the noise at each far-field location at Edwards AFB. However, at Edwards the microphone was attached to a hand-held pole, pointed at the source (0° angle of incidence) and vertically scanned from 0.5 to 3 meters for a period of 5-10 seconds during data acquisition at each microphone location. Both Eglin's and Edwards' samples were then time-integrated to derive a root-mean-square sound pressure level. Vertical scanning and time-integrating together reduce anomalies frequently present in data acquired by a fixed height microphone and now constitute the standard far-field data acquisition/reduction technique used by the AMRL.

RESULTS

Table 5 lists the overall and 1/3 octave band SPL measured at the far-field locations under meteorological conditions at the time of the test. Data in all other figures and tables are based on these levels. These data were normalized to 100 meters distance and standard meteorological conditions (15°C temperature, 70% relative humidity, 0.760 meter Hg barometric pressure) and used to derive the graphic data in Figure 3 which provides a compact summary of the far-field noise characteristics of the A-7D aircraft in a standard format.

Figure 4 and Table 6 present two basic acoustic measures, the acoustic power levels and the directivity index, respectively. The acoustic power level describes the power radiated by the source as a function of frequency. The directivity index is a standard acoustical engineering measure that describes the geometric way in which the source radiates this power as a function of both frequency and angle from source. These basic source measures are primarily of interest for acoustical engineers and noise generation/control specialists.

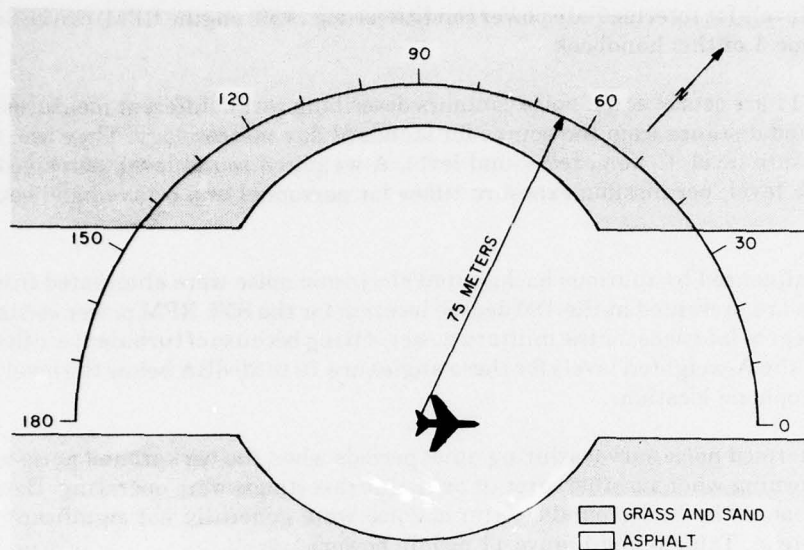


Figure 2(a). Far-Field Measurement Locations at the Hot Cargo Pad, Eglin AFB FL

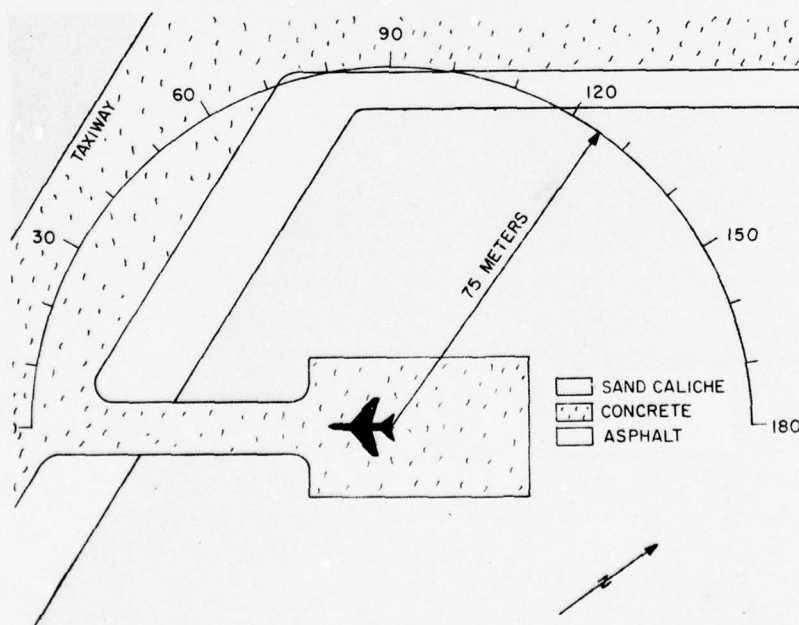


Figure 2(b). Far-Field Measurement Locations at Pad 17 Edwards AFB CA

Estimates of noise levels for intermediate power conditions (e.g., 88% engine RPM) can be determined as explained in Volume 1 of this handbook.

Figures 5 through 11 are sets of equal noise contours describing seven different measures of noise as a function of angle and distance from the source for standard day meteorology. They are, respectively, overall sound pressure level, C-weighted sound level, A-weighted sound level, perceived noise level, speech interference level, permissible exposure times for personnel and octave band sound pressure levels.

Data excessively influenced by spurious background/electronic noise were eliminated from all figures and tables. No data are presented at the 180 degree location for the 85% RPM power setting and at the 160, 170, and 180 degree locations for the military power setting because of turbulent air flow behind the aircraft. Typically, the A-weighted levels for these angles are 10 to 20 dBA below the level measured at the preceding microphone location.

Test personnel performed noise surveys during quiet periods when the background noise was minimal, e.g., early in the morning when no other aircraft or engine test stands were operating. Data eliminated because they were near the background/electronic noise were generally not significant because the levels were so low (e.g., Table 5 and Figure 11 at idle power).

Volume 2 of the handbook describes the influence of meteorology on far-field noise environments, and provides, if required, the factors necessary to adjust the handbook's standard meteorological day data.

TABLE: MEASURED SOUND PRESSURE LEVEL (DB)		IDENTIFICATION:					
OCTAVE BAND							
2		OMEGA 3.2					
		TEST 71-019-100					
NOISE SOURCE/SUBJECT:		RUN 01					
(OPERATION:							
(
(
(		04 DEC 74					
(
(		PAGE J1					
(
		LOCATION/CONDITION					
FREQ (HZ)		1/A	2/A	3/A	4/A	4/B	4/C
31.5		98	100	92	93	96	101
63		93	94	101	106	102	107
125		99	97	91	97	109	116
250		91	92	85	93	109	118
500		91	100	91	92	109	128
1000		95	94	98	94	108	125
2000		88	96	93	92	109	121
4000		88	90	88	87	106	116
8000		84	90	86	85	104	114
OVERALL		104	106	104	108	117	131

TABLE: MEASURES OF HUMAN NOISE EXPOSURE										IDENTIFICATION:
										OMEGA 3.2
										TEST 71-019-100
										RUN 01
										04 DEC 74
										PAGE H1
NOISE SOURCE/SUBJECT: (OPERATION:)										
A-70 AIRCRAFT (()										
GROUND CREW (()										
NEAR FIELD NOISE LEVELS (()										
LOCATION/CONDITION										
1/A 2/A 3/A 4/A 4/B 4/C										
HAZARD/PROTECTION										
C-WEIGHTED OVERALL SOUND LEVEL (OASLC IN DB) AT EAR										
A-WEIGHTED OVERALL SOUND LEVEL (OASLA IN DB) AT EAR										
MAXIMUM PERMISSIBLE TIME (T IN MINUTES) FOR ONE EXPOSURE PER DAY (AFR 161-35, JULY 73)										
NO PROTECTION										
OASLC										103 105 104 107 116 131
OASLA										98 103 98 101 115 130
T										42 13 25 42 2.2 P
MINIMUM QPL EAR MUFFS										
OASLA*										79 81 79 83 92 106
T										960 807 960 571 120 11
AMERICAN OPTICAL 1700 EAR MUFFS										
OASLA*										74 76 75 80 87 100
T										960 960 960 960 285 30
V-51R EAR PLUGS										
OASLA*										73 77 75 74 89 106
T										960 960 960 960 202 11
AMERICAN OPTICAL 1700 EAR MUFFS PLUS V-51R EAR PLUGS										
OASLA*										61 64 63 63 75 91
T										960 960 960 960 960 143
H-133 GROUND COMMUNICATION UNIT										
OASLA*										72 75 74 75 88 101
T										960 960 960 960 240 25
COMMUNICATION										
PREFERRED SPEECH INTERFERENCE LEVEL (PSIL IN DB)										
PSIL										91 98 94 93 109 125
ANNOYANCE										
PERCEIVED NOISE LEVEL, TONE CORRECTED (PNLT IN PND8)										
TONE CORRECTION (C IN DB)										
PNLT										115 120 117 114 130 142
C										3 4 4 1 1 1

TABLE 4
TEST CONDITIONS
FOR FAR-FIELD NOISE MEASUREMENTS

A-7D Aircraft, Ground Runups
Eglin AFB FL, 23 July 1971, Tail # 88221
Edwards AFB CA, 25 September 1972, Tail # 6714584

Aircraft Engine Operation

Idle	54 % RPM, Core Speed 950 LBS/HR, Fuel Flow
85% Runup	85 % RPM, NC
Intermediate (Military)	99.5 % RPM, NC 574 C, EGT 8200 LBS/HR, FF

Meteorology

Eglin AFB	
(Idle, 85%)	Temperature 22.2 C
	Bar Pressure 0.760 M Hg
	Rel Humidity 84 %
	Wind - Speed Calm
Edwards AFB	
(Intermediate)	Temperature 20.0 C
	Bar Pressure 0.700 M Hg
	Rel Humidity 65 %
	Wind - Speed 5.1 M/Sec (10 Kt)
	- Direction 260 Deg

TABLE: MEASURED SOUND PRESSURE LEVEL (DB)										IDENTIFICATION:									
1/3 OCTAVE BAND																			
DISTANCE = 75 METERS																			
NOISE SOURCE/SUBJECT:										TEST 75-002-004									
(OPERATION:										RUN 01									
(A-70 AIRCRAFT										METEOROLOGY:									
(TF41-A-1 ENGINE										TEMP = 22 C									
(FAR FIELD NOISE										BAR PRESS = .760 H MG									
(										REL HUMID = 84 %									
(										PAGE 2									
FREQ (HZ)										ANGLE (DEGREES)									
	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
25	68<	70<	68<	69<	70<	68<	67<	68<	73<	66<	69<	66<	66<	69<	72<	72<	74<	73<	72<
31.5	73<	75<	72<	70<	71<	68<	72<	77<	75<	74<	74<	77<	78<	78<	76<	76<	77<	75<	74<
40	75<	76<	75<	75<	75<	72<	72<	77<	75<	74<	74<	77<	78<	79<	79<	79<	81<	78<	76<
50	78<	78<	78<	77<	75<	72<	78<	77<	75<	79<	77<	78<	80<	80<	82<	80<	81<	77<	74<
63	73<	76<	81<	91<	78<	80<	84<	79<	82<	81<	80<	82<	83<	83<	85<	83<	83<	77<	71<
80	75<	75<	80<	79<	79<	82<	81<	83<	81<	83<	81<	82<	83<	84<	84<	81<	80<	71<	68<
100	75<	74<	75<	74<	74<	74<	79<	73<	74<	76<	72<	75<	75<	78<	78<	76<	72<		
125	77<	77<	72<	78<	74<	78<	78<	79<	78<	79<	79<	79<	80<	82<	83<	80<	75<		
160	73<	72<	67<	73<	73<	70<	73<	73<	74<	75<	74<	76<	76<	78<	79<	74<	68<		
200	69<	70<	64<	69<	71<	68<	70<	71<	73<	72<	72<	74<	76<	75<	75<	71<	63<		
250	64<	65<	66<	66<	65<	65<	67<	68<	71<	70<	69<	72<	74<	72<	72<	67<			
315	66<	66<	67<	65<	69<	68<	68<	66<	68<	69<	70<	72<	73<	75<	73<	68<	56<		
400	69<	70<	70<	69<	71<	69<	68<	69<	70<	71<	73<	75<	76<	77<	76<	69<	55<		
500	69<	69<	69<	68<	68<	67<	67<	65<	66<	68<	70<	73<	76<	77<	76<	70<	53<		
630	69<	69<	68<	69<	68<	67<	67<	65<	66<	68<	70<	73<	76<	75<	71<	68<	51<		
800	68<	68<	68<	70<	68<	65<	65<	66<	66<	69<	71<	73<	77<	76<	71<	68<	53<		
1000	71<	70<	70<	70<	67<	68<	66<	63<	64<	65<	68<	71<	73<	72<	70<	68<	54<		
1250	86<	78<	77<	83<	77<	83<	82<	76<	73<	68<	71<	74<	74<	73<	71<	69<	61<	44<	41<
1600	71<	69<	69<	70<	71<	72<	69<	66<	66<	70<	73<	77<	75<	72<	71<	68<	54<	41<	40<
2000	73<	74<	74<	76<	71<	71<	69<	66<	65<	69<	72<	77<	77<	73<	70<	66<	55<	43<	40<
2500	75<	76<	73<	71<	79<	73<	69<	65<	65<	69<	73<	77<	77<	73<	72<	66<	55<	42<	39<
3150	74<	74<	74<	76<	72<	69<	67<	62<	63<	67<	71<	77<	76<	71<	69<	59<	48<	40<	39<
4000	77<	78<	76<	77<	76<	72<	69<	64<	64<	68<	74<	78<	78<	75<	72<	59<	49<	41<	40<
5000	79<	78<	78<	79<	76<	73<	70<	63<	61<	65<	72<	76<	75<	74<	71<	58<	47<	39<	38<
6300	76<	75<	74<	77<	75<	73<	69<	62<	61<	65<	70<	73<	75<	74<	72<	56<	46<	37<	35<
8000	74<	75<	74<	74<	74<	73<	67<	62<	60<	64<	70<	74<	75<	75<	73<	58<	46<	37<	
10000	70<	70<	70<	70<	69<	65<	63<	58<	59<	64<	69<	70<	71<	70<	67<	54<	42<		
OVERALL	90	88	89	90	88	89	89	88	88	89	88	91	91	91	92	89	88	83	81

< LEVEL CORRECTED TO REMOVE BACKGROUND/ELECTRONIC NOISE.

TABLE:		MEASURED SOUND PRESSURE LEVEL (DB)										IDENTIFICATION:								
5		1/3 OCTAVE BAND										OMEGA 1.4								
		DISTANCE = 75 METERS										TEST 75-002-004								
NOISE SOURCE/SUBJECT:		(OPERATION:										RUN 02								
		(85% RPM																		
A-70 AIRCRAFT		(BAR PRESS = .760 M HG										06 MAY 75								
TF41-A-1 ENGINE		(FREE FLOW																		
FAR FIELD NOISE		(										PAGE 2								
		ANGLE (DEGREES)																		
FREQ (HZ)		0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
25	70<	71<	73<	73<	73<	75<	75<	75<	78	78	79	80	81	84	90	92	92	90	89	
31.5	73<	72<	74<	74<	74<	75<	75<	75<	79	79	82	81	83	88	92	94	95	92	91	
40	73<	76	75<	76	77	77	77	78	79	82	84	84	86	90	95	98	96	94	91	
50	75	75	75	77	78	77	78	78	82	83	85	86	88	93	98	101	99	94	87	
63	77<	78	77<	76<	80	80	80	82	84	87	88	89	89	94	100	103	99	93	81	
80	78	78	79	79	80	80	80	82	84	85	87	88	89	91	96	103	105	100	91	76
100	81	80	81	82	81	83	83	85	87	88	91	92	95	100	107	109	102	92	74<	
125	82	83	83	85	85	85	85	87	90	91	93	94	95	99	103	111	113	105	90	78
160	83	82	85	85	85	86	86	88	90	91	94	95	99	103	111	114	104	87	75	
200	83	83	85	84	85	85	85	87	89	90	92	94	98	103	106	114	102	78	74	
250	81	82	83	83	84	85	85	85	88	89	91	93	97	100	105	112	95	77	70<	
315	82	84	84	84	85	85	85	87	89	90	93	96	99	102	107	110	90	77	68	
400	84	87	86	87	89	87	87	91	92	95	97	98	102	104	107	109	93	76	66	
500	81	85	85	87	89	88	88	90	92	93	94	97	100	105	105	106	91	69	62	
630	77	81	81	82	84	84	84	87	87	89	93	96	99	101	103	102	88	66	63	
800	78	81	83	84	84	84	84	87	89	91	93	95	98	101	103	101	91	65	60	
1000	76	78	81	81	82	83	83	85	87	89	91	95	96	98	98	98	88	63	57	
1250	75	78	81	82	83	84	84	86	87	89	90	93	96	95	95	95	85	62	54	
1600	73	76	79	79	81	83	83	85	85	85	89	90	93	96	95	92	82	59	54	
2000	77	78	79	81	81	84	83	84	86	88	89	91	93	94	91	79	58	54		
2500	83	83	81	83	83	84	84	82	83	88	88	88	89	92	92	87	73	59	55	
3150	84	83	82	80	82	84	84	82	82	83	88	89	88	88	88	84	69	56	57	
4000	83	83	81	77	79	80	80	80	80	82	90	93	89	88	88	82	66	55	53	
5000	83	83	80	79	79	78	78	78	80	81	86	89	87	86	86	80	63	53	51	
6300	82	81	76	79	77	77	77	77	79	81	85	87	86	85	85	79	62	51	47	
8000	78	78	75	74	75	75	75	75	77	81	85	88	86	85	84	79	63	51	47	
10000	74	72	69	70	71	71	71	71	73	76	81	84	80	80	80	74	60	47	43<	
OVERALL	94	95	96	96	97	97	97	99	101	102	105	107	109	113	118	121	111	101	96	
< LEVEL CORRECTED TO REMOVE BACKGROUND/ELECTRONIC NOISE.																				

TABLE: MEASURED SOUND PRESSURE LEVEL (DB)																	IDENTIFICATION:		
1/3 OCTAVE BAND																	) OMEGA 1.4		
DISTANCE = 75 METERS																	) TEST 75-002-051		
NOISE SOURCE/SUBJECT:																	) RUN 01		
(OPERATION:																	) METEOROLOGY:		
(MILITARY POWER																	) TEMP = 20 C		
(99.5% RPM																	) BAR PRESS = .700 M HG		
(FREE FLOW																	) REL HUMID = 65 %		
																	) PAGE 2		
FREQ (HZ)																	) ANGLE (DEGREES)		
	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
25	80	79	80	81	82	79	84	85	84	86	85	87	91	95	100	101			
31.5	81	82	82	82	84	83	84	87	87	87	88	88	95	99	103	104			
40	83	83	84	83	85	85	85	86	90	90	91	92	97	103	107	105			
50	84	85	86	86	86	87	88	89	92	93	95	97	102	108	111	108			
63	86	86	87	88	88	90	91	92	93	93	96	98	102	110	113	109			
80	87	88	88	88	89	90	91	93	95	96	98	100	106	113	117	110			
100	89	89	90	92	91	92	93	94	97	99	100	102	109	118	119	111			
125	92	91	92	92	93	92	95	95	99	101	102	103	112	119	119	112			
160	94	92	96	94	95	95	96	97	101	104	104	106	113	122	121	114			
200	92	94	95	96	95	97	97	99	103	104	105	107	112	122	121	115			
250	92	95	96	97	96	97	98	99	103	103	104	108	112	118	119	116			
315	96	100	100	101	99	98	98	99	100	102	104	108	112	117	114	114			
400	104	109	109	107	107	105	102	99	101	100	102	106	109	114	114	112			
500	103	108	109	109	109	106	103	100	98	101	101	107	108	113	115	110			
630	100	105	108	109	108	108	106	103	99	99	101	105	108	113	115	106			
800	96	101	104	106	106	106	104	103	101	100	101	104	108	113	115	102			
1000	94	99	102	104	104	103	101	101	102	102	102	104	110	112	114	100			
1250	91	96	100	102	103	102	101	100	101	103	102	103	108	110	112	100			
1600	90	96	98	101	103	102	101	101	101	103	103	104	106	110	112	99			
2000	88	93	96	99	100	100	100	100	100	101	102	104	104	109	109	97			
2500	87	92	95	99	100	100	100	100	100	101	103	106	105	108	109	96			
3150	87	91	94	97	99	99	100	99	100	101	102	105	104	106	108	96			
4000	83	88	92	95	96	97	97	98	98	99	101	102	102	105	106	93			
5000	82	87	91	94	95	96	96	96	97	99	100	101	101	104	105	92			
6300	78	83	88	90	92	93	94	94	94	96	97	98	98	101	103	89			
8000	75	80	85	88	89	90	90	91	92	93	94	95	96	99	102	87			
10000	69	74	78	82	84	86	85	85	86	88	89	91	92	96	99	84			
OVERALL	109	113	115	115	115	115	113	112	113	114	115	118	122	129	129	123			
LEVEL CORRECTED TO REMOVE BACKGROUND/ELECTRONIC NOISE.																			

LEVEL CORRECTED TO REMOVE BACKGROUND/ELECTRONIC NOISE.

TABLE: DIRECTIVITY INDEX (DB)										IDENTIFICATION:									
6										OMEGA 1.4									
NOISE SOURCE/SUBJECT:										TEST 75-002-004									
(										RUN 01									
(										METEOROLOGY:									
(										TEMP = 22 C									
(										BAR PRESS = .760 M HG									
(										REL HUMID = 84 %									
(										06 MAY 75									
(										PAGE 4									
FREQ (HZ)										ANGLE (DEGREES)									
	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
1/3 OCTAVE																			
25	1	2	1	1	3	0	-5	-4	1	-1	-3	-1	-1	1	4	5	6	5	4
31.5	1	3	-0	-2	-1	-4	-5	0	-1	-1	-2	-3	0	2	3	4	5	3	2
40	-1	-1	-2	-1	-1	-5	-0	-1	-3	-3	-2	1	2	2	3	3	4	2	-0
50	-0	-0	-0	-1	-4	-7	-0	-1	-3	1	-1	-0	1	2	4	2	3	-1	-4
63	-8	-6	-1	-1	-4	-1	2	-3	-0	-0	-2	0	1	1	3	1	1	-5	-10
80	-6	-7	-2	-2	-3	0	-1	-2	-1	1	-1	-0	1	2	3	-1	-2	-11	-14
100	-0	-1	-1	-1	-1	-1	3	-2	-1	0	-3	-0	-0	2	3	0	-3	-4	
125	-2	-3	-7	-2	-5	-1	-1	-0	-1	0	-0	1	1	3	4	0	-4	-6	
160	-1	-3	-7	-1	-1	-4	-1	-1	-0	0	-0	1	1	3	3	-2	-9		
200	-4	-2	-8	-3	-2	-5	-3	-1	-1	-0	-0	1	3	3	3	-3			
250	-6	-5	-4	-4	-4	-5	-3	-2	1	-0	-0	3	4	2	3	-2	-14		
315	-4	-4	-3	-5	-2	-2	-2	-4	-2	-1	-0	2	3	5	3	-3	-17		
400	-4	-4	-2	-3	-1	-3	-4	-4	-3	-1	0	2	3	5	3	-4	-21		
500	-6	-5	-5	-3	-3	-5	-2	-2	-1	-0	-1	1	5	3	2	-4	-19		
630	-2	-1	-2	-1	-2	-3	-4	-5	-4	-2	-1	2	5	4	1	-3	-18		
800	-3	-3	-3	-1	-3	-6	-6	-5	-5	-2	-0	2	6	5	0	-3	-15		
1000	3	1	1	1	-2	-1	-3	-6	-5	-3	-1	3	4	3	1	-1	-16	-33	-36
1250	9	1	0	6	-0	6	5	-1	-4	-9	-6	-3	-3	-4	-6	-8	-18	-30	
1600	-1	-3	-3	-2	-1	-2	-3	-6	-7	-2	1	5	3	0	-1	-4	-17	-29	-32
2000	1	2	2	4	-1	-2	-5	-9	-8	-5	-1	4	4	0	-2	-6	-17	-31	-34
2500	2	2	-0	-3	6	-0	-5	-9	-9	-5	-1	4	4	-0	-2	-8	-18	-31	-34
3150	2	2	2	4	1	-3	-4	-9	-9	-5	-1	5	4	-0	-3	-13	-23	-31	-32
4000	3	4	2	3	2	-1	-4	-10	-10	-5	-0	4	4	1	-2	-15	-25	-32	-34
5000	6	4	5	5	3	-0	-4	-10	-12	-6	-2	3	4	1	-3	-16	-27	-34	-35
6300	4	3	2	3	3	2	-3	-9	-11	-7	-2	2	3	2	-0	-16	-26	-35	-37
8000	3	4	2	3	2	2	-4	-10	-12	-8	-2	2	3	4	1	-14	-25	-35	
10000	3	2	2	2	2	-2	-5	-9	-9	-4	2	3	4	2	-1	-13	-25		
OCTAVE																			
31.5	-0	1	-1	-1	-0	-4	-5	-1	-1	-2	-3	-0	1	2	3	3	5	2	1
63	-5	-4	-1	-2	-3	-1	1	-1	-1	0	-1	0	1	2	3	1	1	-5	-9
125	-1	-2	-4	-1	-3	-2	0	-1	-1	0	-1	1	1	3	3	0	-4		
250	-4	-3	-5	-4	-2	-4	-3	-2	0	-0	-0	2	3	3	3	-2	-12		
500	-4	-3	-3	-3	-2	-4	-3	-3	-2	-1	-0	2	5	4	2	-4	-19		
1000	-7	-1	-0	5	-1	5	4	-2	-4	-6	-3	-1	1	0	-3	-5	-16		
2000	1	1	0	1	3	-1	-4	-7	-7	-3	0	5	4	0	-2	-6	-18	-30	-35
4000	4	4	3	4	2	-1	-4	-10	-10	-6	-1	4	4	1	-2	-15	-25	-33	-34
8000	3	3	2	4	3	1	-4	-9	-11	-7	-1	2	3	3	0	-14	-26	-35	
OVERALL	1	-1	-1	0	-1	-1	-0	-2	-2	-1	-1	1	2	2	2	-0	-1	-6	-8

TABLE: DIRECTIVITY INDEX (DB)																	IDENTIFICATION:		
6																	OMEGA 1.4		
TEST 75-002-004																	RUN 02		
NOISE SOURCE/SUBJECT:																	06 MAY 75		
(OPERATION:																	PAGE 4		
(A-70 AIRCRAFT																			
(TF41-A-1 ENGINE																			
(FAR FIELD NOISE																			
METEOROLOGY:																			
(TEMP = 22 C																			
(BAR PRESS = .760 M HG																			
(REL HUMID = 84 %																			
FREQ	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
(HZ)																			
1/3 OCTAVE																			
25	-15	-14	-14	-12	-12	-10	-10	-7	-7	-6	-5	-4	-1	5	7	7	5	4	
31.5	-14	-15	-13	-13	-14	-12	-12	-9	-8	-5	-6	-4	0	4	7	7	5	3	
40	-17	-14	-15	-14	-13	-13	-13	-11	-8	-6	-6	-4	-0	5	8	6	4	1	
50	-18	-17	-18	-16	-14	-16	-14	-11	-10	-8	-7	-5	1	5	8	6	1	-5	
63	-17	-17	-17	-18	-14	-15	-14	-12	-10	-7	-7	-5	-1	5	9	5	-1	-13	
80	-18	-18	-17	-17	-16	-16	-15	-12	-11	-9	-8	-5	0	6	9	4	-5	-20	
100	-19	-20	-19	-18	-19	-17	-15	-13	-12	-9	-8	-5	-0	7	9	2	-8	-26	
125	-21	-21	-20	-19	-21	-19	-17	-14	-13	-11	-9	-6	-1	7	10	1	-13	-26	
160	-22	-22	-19	-20	-19	-18	-16	-14	-13	-10	-9	-6	-1	6	10	-1	-17	-29	
200	-20	-20	-18	-20	-19	-18	-17	-14	-13	-11	-9	-6	-1	5	11	-2	-26	-30	
250	-20	-19	-18	-18	-17	-16	-16	-13	-12	-10	-8	-6	-1	4	11	-6	-24	-31	
315	-19	-17	-17	-17	-16	-16	-13	-12	-10	-7	-5	-2	1	6	10	-11	-24	-32	
400	-18	-14	-15	-14	-13	-14	-11	-9	-7	-5	-3	1	3	6	8	-9	-26	-35	
500	-18	-14	-14	-12	-10	-11	-9	-8	-7	-5	-3	0	6	6	7	-8	-30	-37	
630	-19	-16	-16	-14	-13	-13	-10	-9	-7	-3	-1	3	5	6	5	-9	-31	-34	
800	-19	-15	-13	-12	-12	-12	-9	-7	-6	-4	-1	1	5	7	5	-5	-32	-36	
1000	-17	-15	-12	-12	-11	-10	-9	-7	-5	-3	-1	3	4	6	6	-5	-29	-36	
1250	-16	-12	-9	-9	-8	-7	-7	-5	-4	-2	-1	3	5	5	5	-6	-29	-36	
1600	-17	-14	-11	-11	-10	-7	-7	-6	-5	-1	0	2	6	5	5	-8	-31	-36	
2000	-11	-10	-9	-8	-7	-5	-5	-3	-3	-1	0	2	5	5	2	-9	-31	-34	
2500	-4	-4	-6	-4	-4	-3	-5	-5	-4	1	1	2	5	5	0	-14	-28	-32	
3150	-1	-2	-3	-5	-4	-1	-4	-4	-3	2	4	2	2	2	-1	-17	-30	-28	
4000	-3	-4	-5	-9	-7	-7	-6	-7	-4	3	6	2	1	2	-5	-20	-32	-33	
5000	-1	-1	-4	-5	-5	-6	-6	-4	-3	2	5	3	2	2	-4	-21	-31	-33	
6300	-1	-2	-7	-4	-5	-6	-6	-4	-2	2	4	3	2	2	-4	-21	-32	-35	
8000	-5	-5	-7	-8	-8	-7	-7	-5	-2	2	5	3	3	2	-4	-20	-31	-35	
10000	-5	-6	-9	-9	-7	-8	-7	-5	-2	3	6	2	2	2	-4	-18	-31	-35	
OCTAVE																			
31.5	-15	-14	-14	-13	-13	-12	-12	-9	-8	-6	-6	-4	-0	5	8	7	4	2	
63	-18	-17	-17	-17	-15	-16	-14	-12	-10	-8	-7	-5	0	6	9	5	-2	-11	
125	-21	-21	-20	-19	-20	-18	-16	-14	-13	-10	-9	-6	-1	7	10	1	-13	-27	
250	-20	-19	-18	-19	-18	-17	-15	-13	-12	-10	-7	-4	-0	5	11	-4	-25	-31	
500	-18	-14	-15	-13	-12	-13	-10	-9	-7	-4	-2	1	4	6	7	-8	-27	-36	
1000	-17	-15	-12	-11	-11	-10	-9	-7	-5	-3	-1	2	4	6	5	-5	-30	-36	
2000	-9	-8	-9	-8	-7	-5	-6	-5	-4	-1	0	2	5	5	2	-9	-30	-34	
4000	-2	-3	-4	-6	-5	-4	-5	-3	-3	3	5	2	2	2	-3	-19	-31	-31	
8000	-3	-3	-7	-6	-7	-6	-7	-4	-2	2	5	3	2	2	-4	-20	-32	-35	
OVERALL	-17	-16	-16	-16	-15	-15	-13	-11	-10	-7	-5	-2	1	6	9	-1	-10	-16	

TABLE: DIRECTIVITY INDEX (DB)													IDENTIFICATION:												
6													OMEGA 1.4												
NOISE SOURCE/SUBJECT:													TEST 75-002-051												
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FIGURE 1 NORMALIZED FARFIELD NOISE LEVELS

3 DISTANCE = 100 METERS

NOISE SOURCE/SUBJECT:

A-70 AIRCRAFT

TF41-A-1 ENGINE

FAR FIELD NOISE

OPERATION:

IDLE

54% RPM

FREE FLOW

METEOROLOGY:

TEMP = 15 C

BAR PRESS = .760 M HG

REL HUMID = 70 %

IDENTIFICATION:

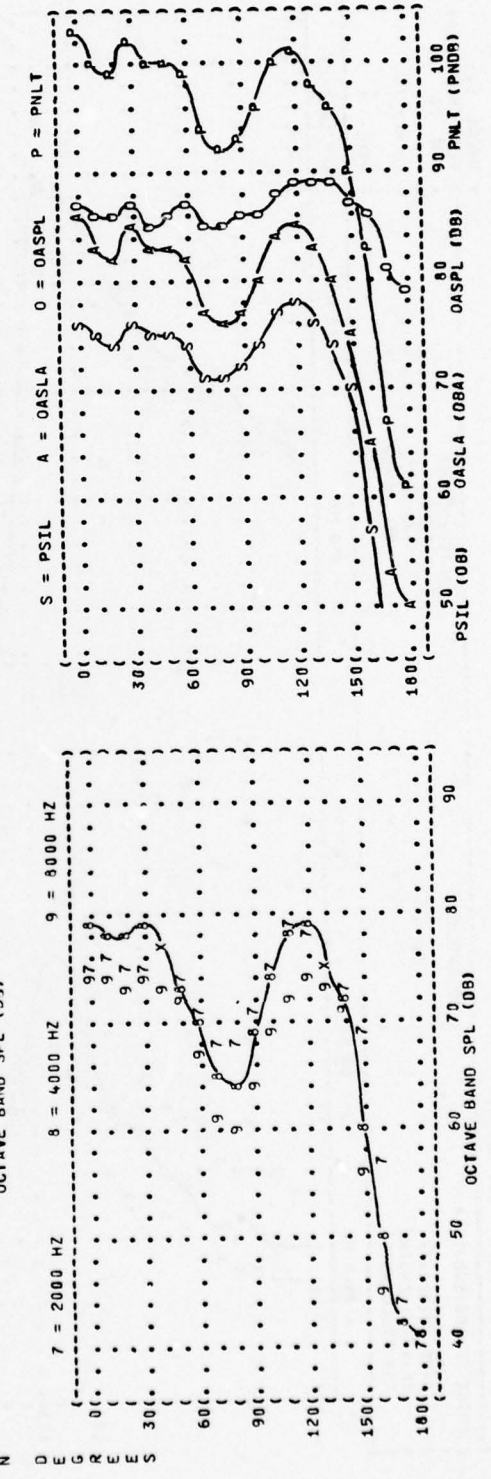
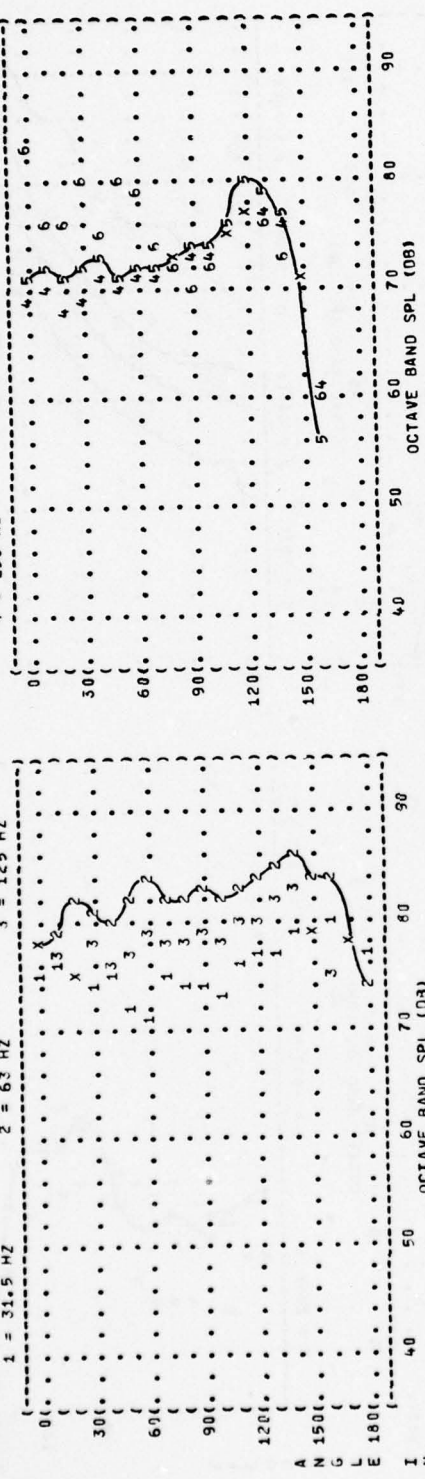
OMEGA 1.4

TEST 75-002-004

RUN 01

06 MAY 75

PAGE 6



FIGURE# NORMALIZED FARFIELD NOISE LEVELS

3

DISTANCE = 100 METERS

NOISE SOURCE/SUBJECT:

A-70 AIRCRAFT

TF41-A-1 ENGINE

FAR FIELD NOISE

OPERATION:

(85% RPM

(FREE FLOW

(

METEOROLOGY:

TEMP = 15 C

BAR PRESS = .760 M HG

REL HUMID = 70 %

IDENTIFICATION:

OMEGA 1-4

TEST 75-002-004

RUN 02

06 MAY 75

PAGE 6

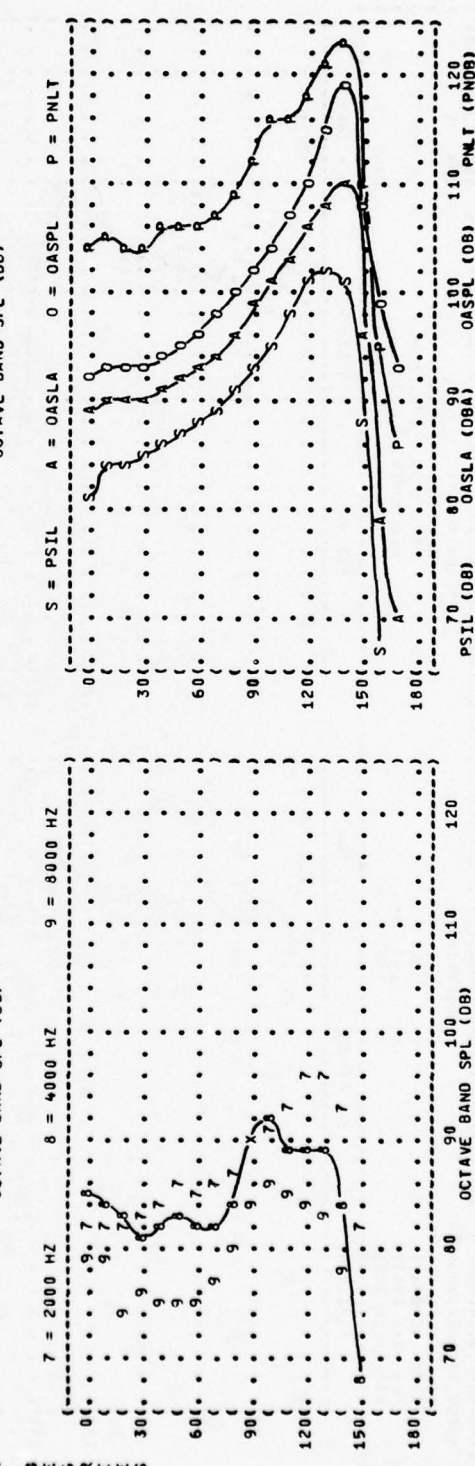
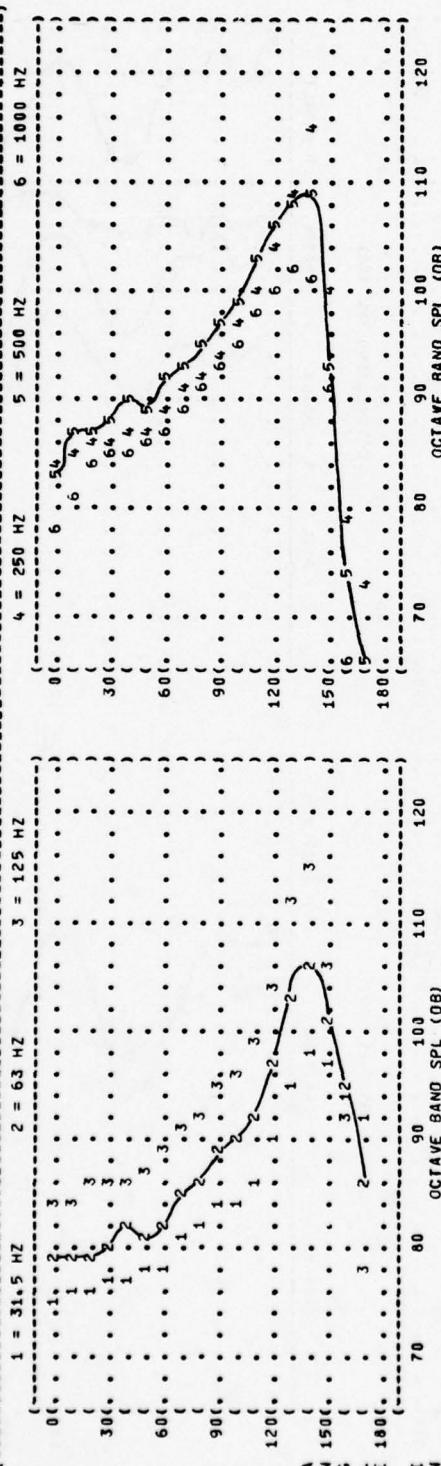


FIGURE 1 NORMALIZED FARFIELD NOISE LEVELS

3 DISTANCE = 100 METERS

NOISE SOURCE/SUBJECT:

4-70 AIRCRAFT

TF41-A-1 ENGINE

FAR FIELD NOISE

OPERATION:

MILITARY POWER

99.5% RPM

FREE FLOW

METEOROLOGY:

TEMP = 15 C

BAR PRESS = .760 M HG

REL HUMID = 70 %

OMEGA 1.4

TEST 75-002-051

RUN 01

20 MAY 75

PAGE 6

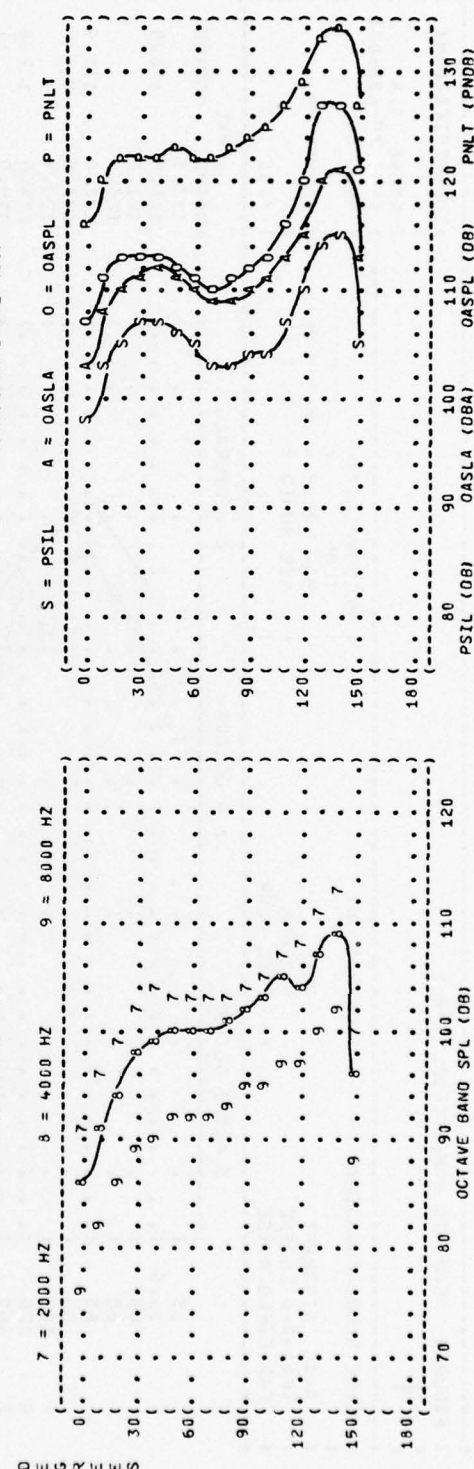
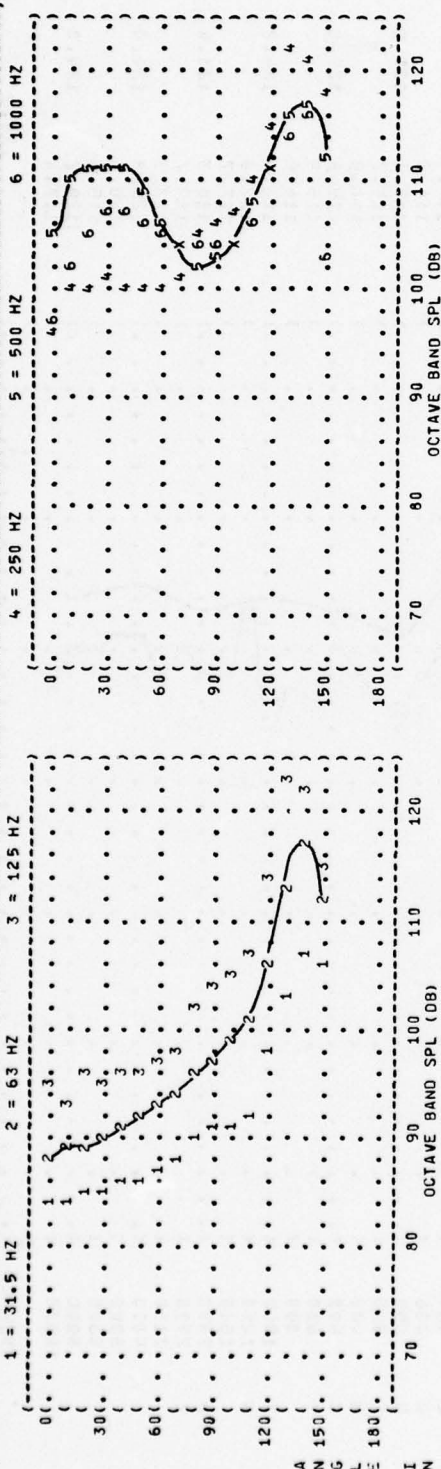


FIGURE: ACOUSTIC POWER LEVEL (PWL)

4

IDENTIFICATION:

OMEGA 1.4

TEST 75-002-004

RUN 01

06 MAY 75

PAGE 3

NOISE SOURCE/SUBJECT:

OPERATION:

METEOROLOGY:

TEMP = 22 C

BAR PRESS = .760 M HG

REL HUMID = 84 %

A-7D AIRCRAFT

TF41-A-1 ENGINE

54% RPM

FREE FLOW

3 = 1/3 OCTAVE

1 = OCTAVE

0 = OVERALL

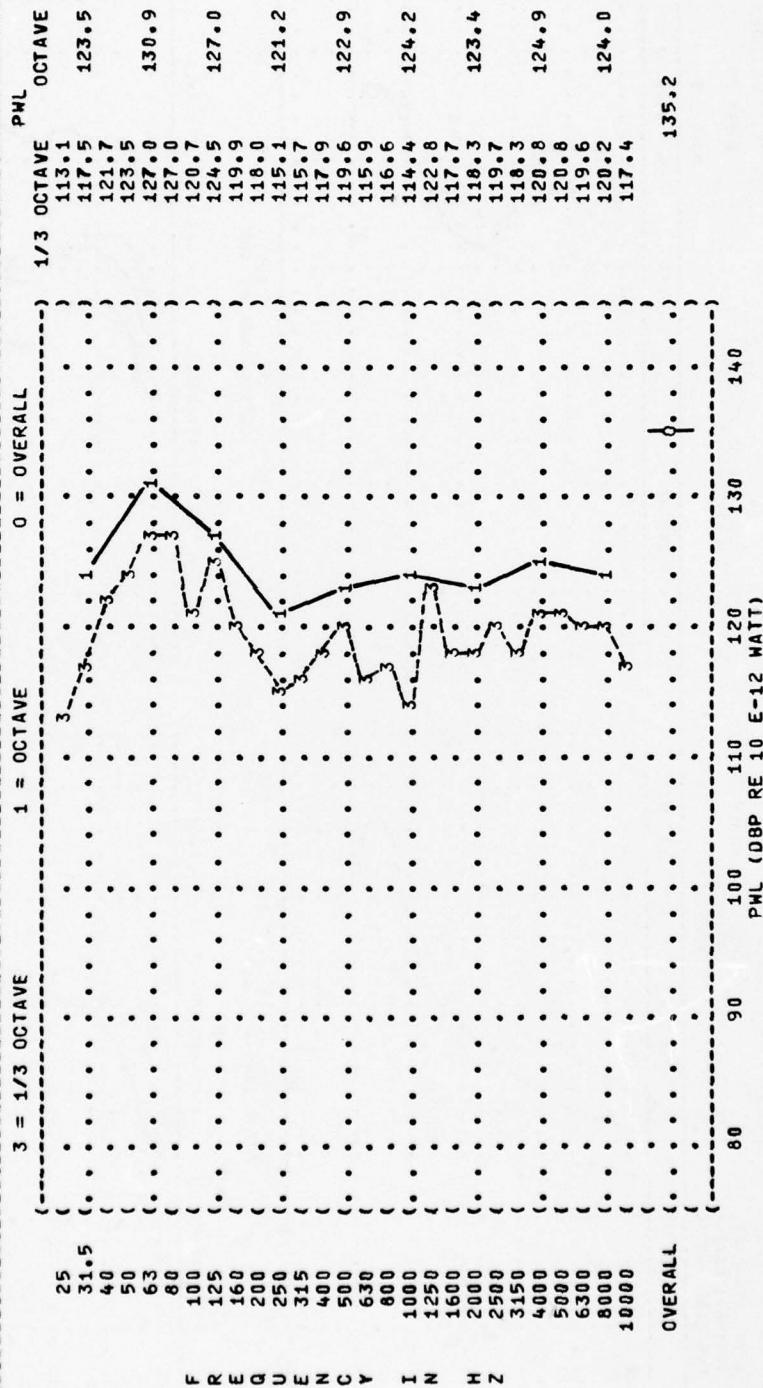


FIGURE: ACOUSTIC POWER LEVEL {PWL}

4

IDENTIFICATION:

OMEGA 1.4

TEST 75-002-004

RUN 02

06 MAY 75

PAGE 3

NOISE SOURCE/SUBJECT:

OPERATION:

85% RPM

FREE FLOW

METEOROLOGY:

TEMP = 22 C

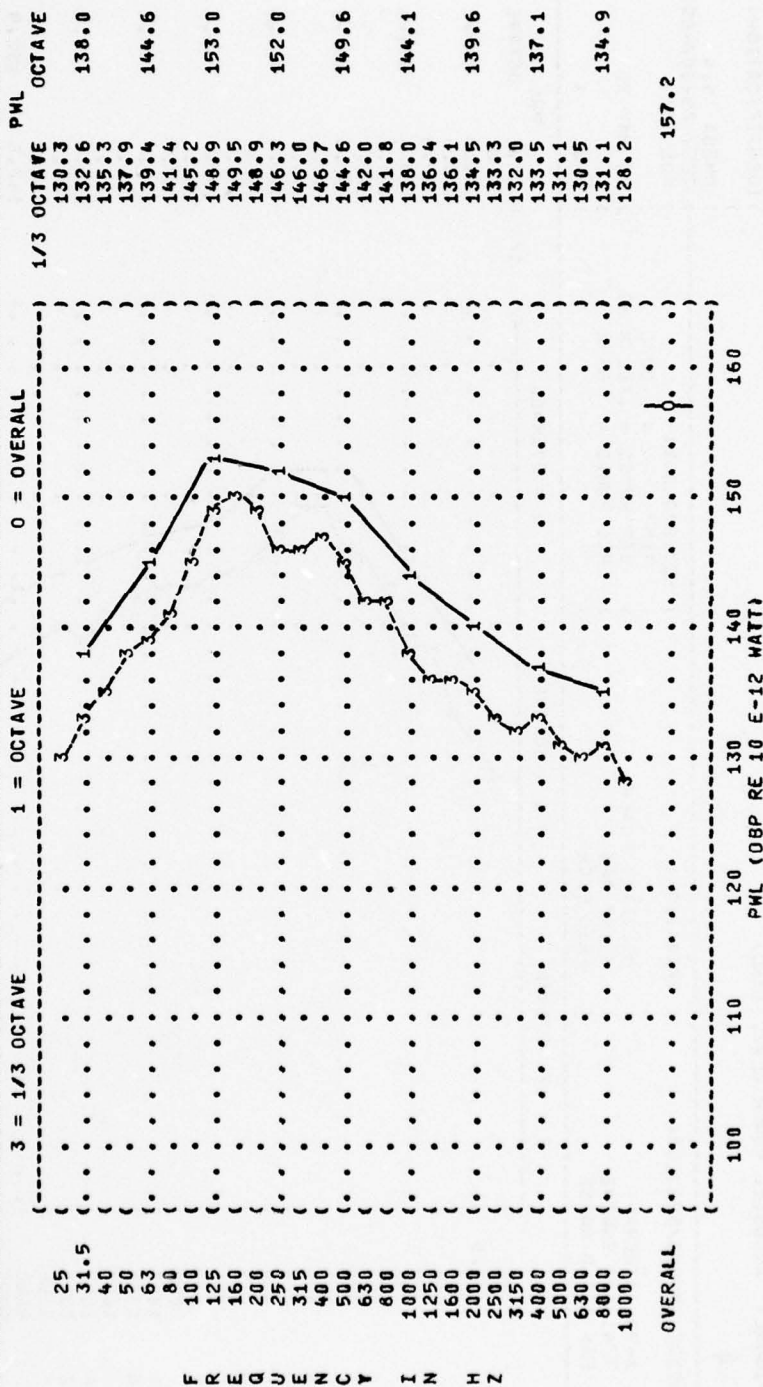
BAR PRESS = .760 M HG

REL HUMID = 84 %

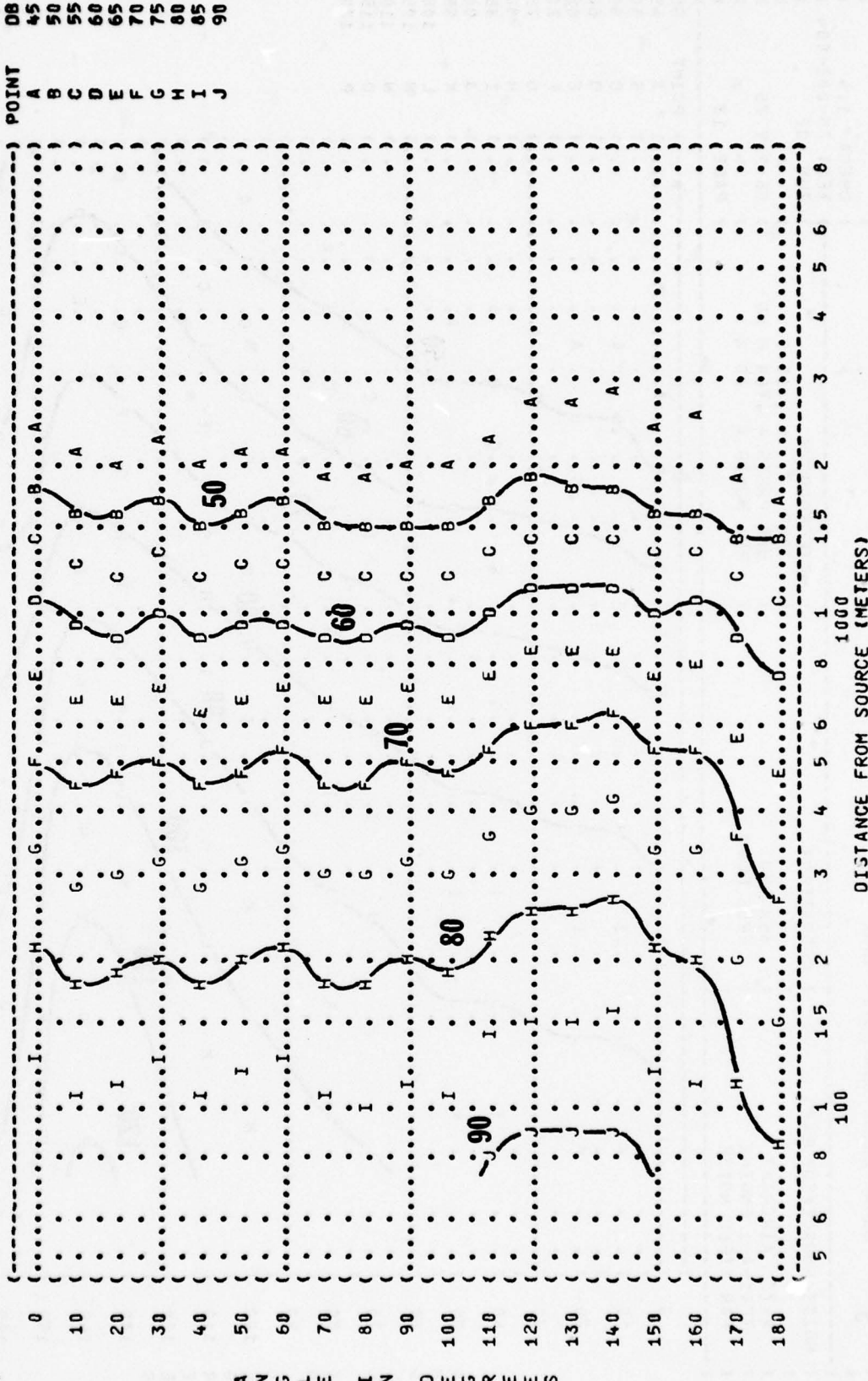
A-70 AIRCRAFT

TF41-A-1 ENGINE

FAR FIELD NOISE

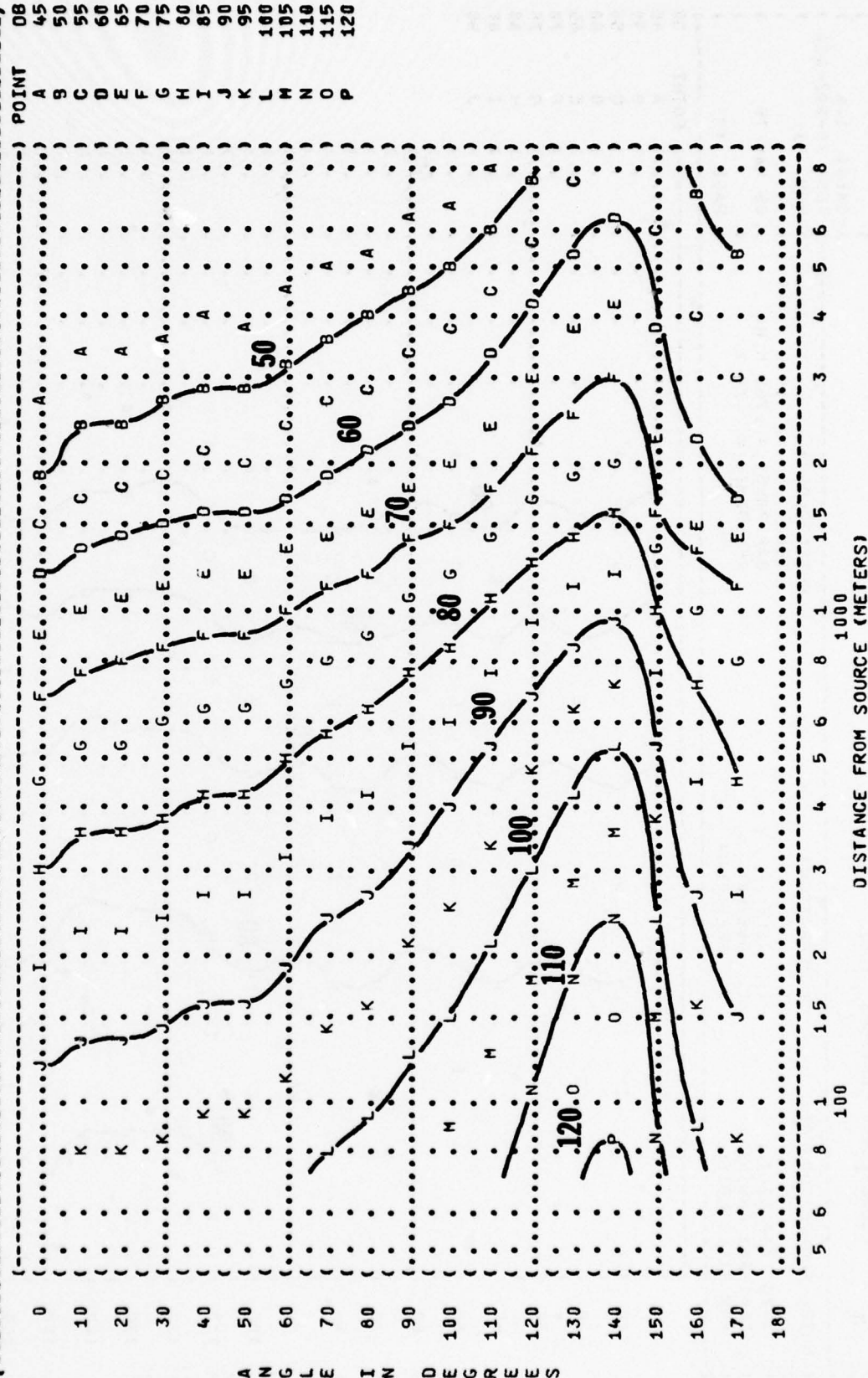


(FIGURE: OVERALL SOUND PRESSURE LEVEL (OASPL)
 (5 EQUAL LEVEL CONTOURS (DB)
 () IDENTIFICATION:
 () OMEGA 1.4
 () TEST 75-002-004
 () RUN 01
 () METEOROLOGY:
 () TEMP = 15 C
 () BAR PRESS = .760 M HG
 () REL HUMID = 70 %
 () 06 MAY 75
 () PAGE 13
 () NOISE SOURCE/SUBJECT:
 () OPERATION:
 () IDLE
 () 54% RPM
 () FREE FLOW
 () A-7D AIRCRAFT
 () TF41-A-1 ENGINE
 () FAR FIELD NOISE



A N G L E I N D E G R E E S

FIGURE: OVERALL SOUND PRESSURE LEVEL (OASPL)
 5
 IDENTIFICATION:
 OMEGA 1.4
 TEST 75-002-004
 RUN 02
 METEOROLOGY:
 TEMP = 15 C
 BAR PRESS = .760 M HG
 REL HUMID = 70 %
 OPERATION:
 85% RPM
 FREE FLOW
 NOISE SOURCE/SUBJECT:
 A-70 AIRCRAFT
 TF41-A-1 ENGINE
 FAR FIELD NOISE
 06 MAY 75
 PAGE 13




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( ( FIGURE: C-WEIGHTED OVERALL SOUND LEVEL {OASLC}
( ( EQUAL LEVEL CONTOURS (DBC)
( (
( ( 6
( (
( ( NOISE SOURCE/SUBJECT: ( OPERATION: ( METEOROLOGY: ( IDENTIFICATION:
( ( A-70 AIRCRAFT ( ( TEMP = 15 C ( ( OMEGA 1.4
( ( TF41-A-1 ENGINE ( ( BAR PRESS = .760 M HG ( ( TEST 75-002-004
( ( FAR FIELD NOISE ( ( REL HUMID = 70 % ( ( RUN 01
( ( ( ( ( ( PAGE 14

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NOISE SOURCE/SUBJECT:	OPERATION:	METEOROLOGY:	TEMP	BAR PRESS	REL HUMID	DATE	TIME	PAGE
A-70 AIRCRAFT	IDLE		15 C	.760 H HG		06 MAY 75		
TF41-A-1 ENGINE	54% RPM				70 %			
FAR FIELD NOISE	FREE FLOW							

NOISE SOURCE/SUBJECT:	OPERATION:	METEOROLOGY:	TEMP	BAR PRESS	REL HUMID	RUN
A-70 AIRCRAFT	IDLE		15 C	.760 M HG		01
TF41-A-1 ENGINE	54% RPM					75
FAR FIELD NOISE	FREE FLOW					14

[illegible]

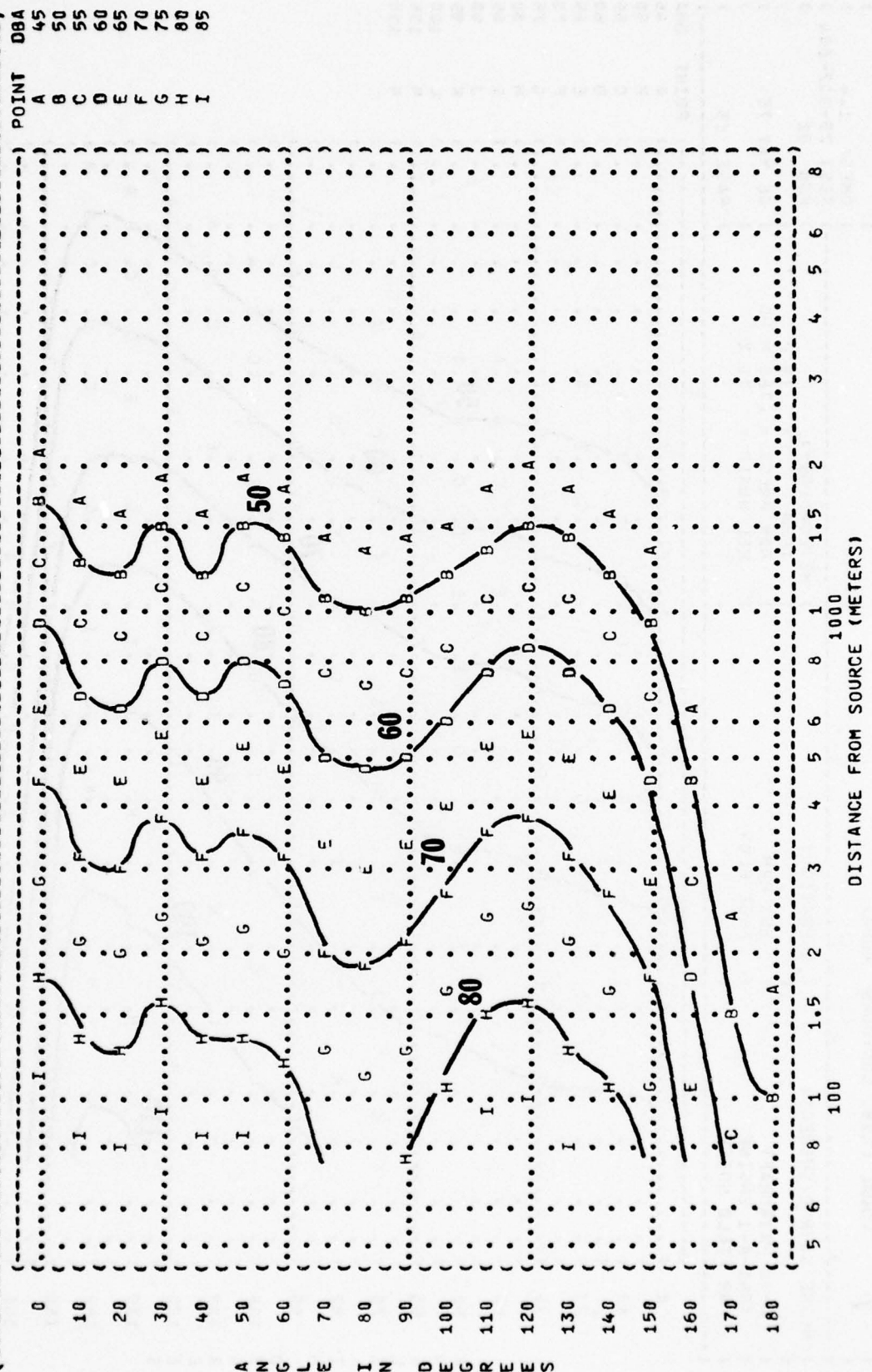
A 12x50 grid of dots with three wavy lines drawn across it. The lines are labeled with numbers 60, 70, and 80. The grid is labeled with letters A through J on the left and numbers 50 through 120 on the right.

Letter	50	60	70	80	90	100	110	120
A
B
C
D
E
F
G
H
I
J

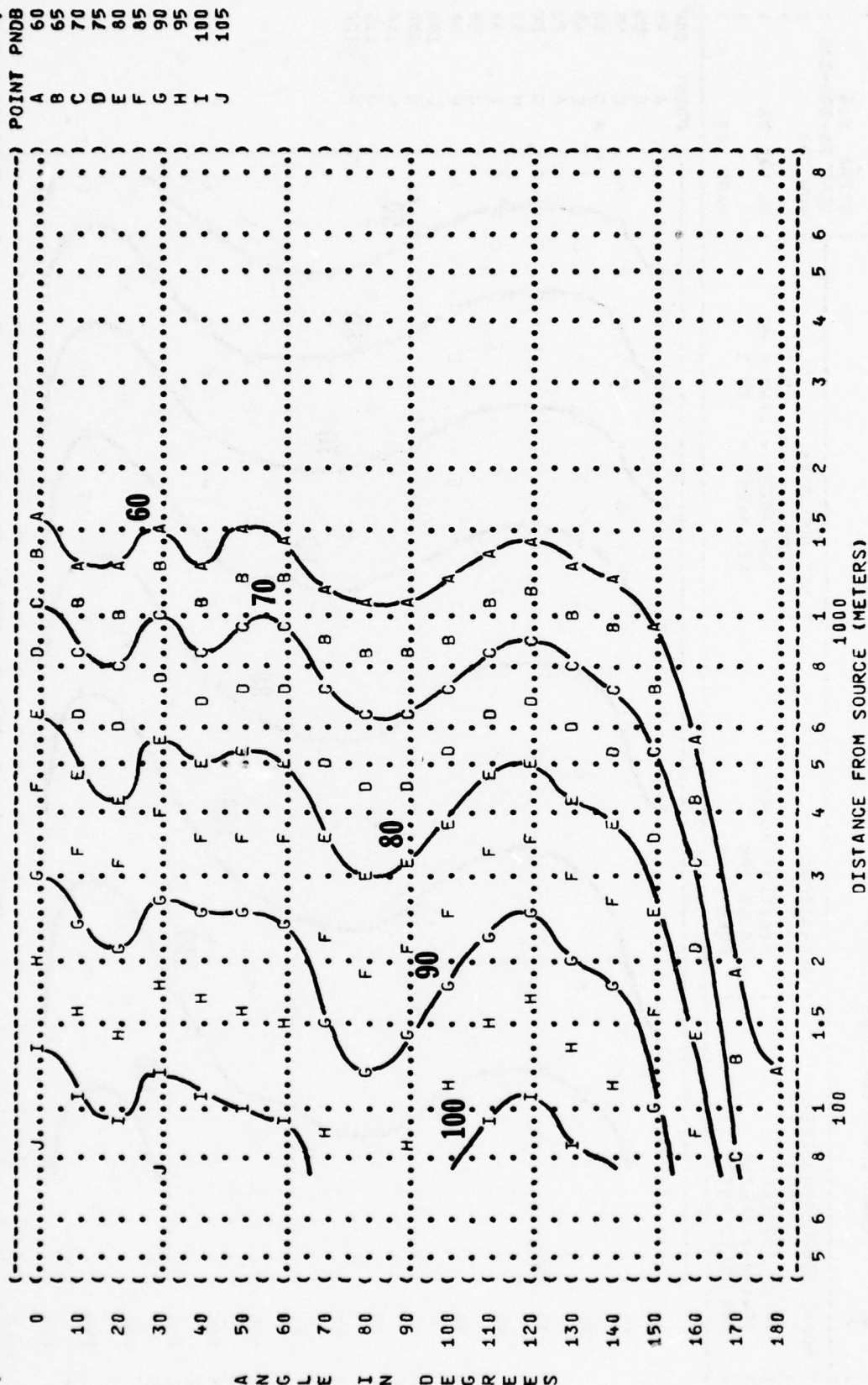
The wavy lines are labeled with numbers 60, 70, and 80. The line labeled 60 is the lowest, the line labeled 70 is the middle, and the line labeled 80 is the highest.

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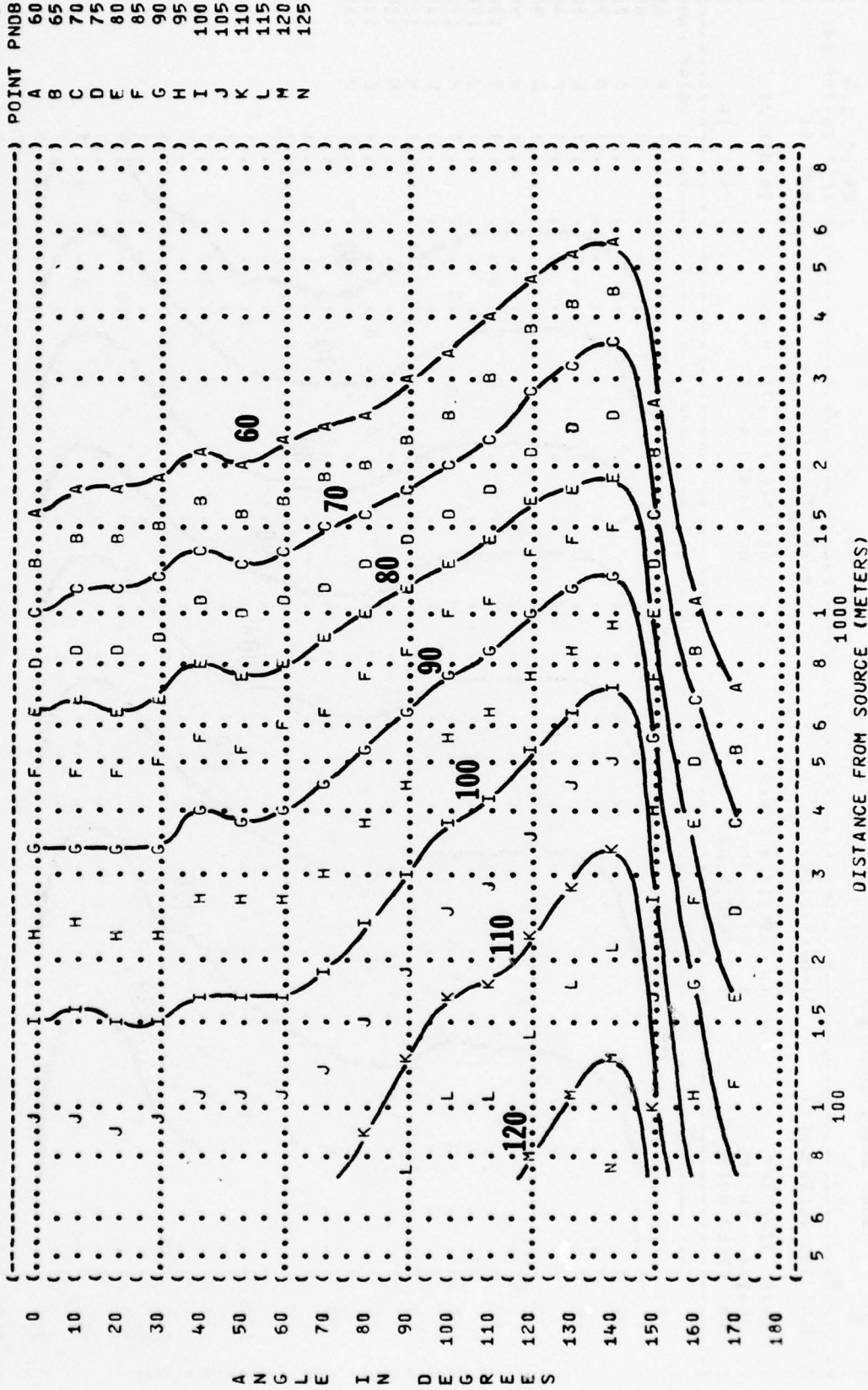
FIGURE: A-WEIGHTED OVERALL SOUND LEVEL (OASLA)
 7
 IDENTIFICATION:
 OMEGA 1.4
 TEST 75-002-004
 RUN 01
 METEOROLOGY:
 TEMP = 15 C
 BAR PRESS = .760 M HG
 REL HUMID = 70 %
 NOISE SOURCE/SUBJECT:
 OPERATION:
 A-70 AIRCRAFT
 IDLE
 TF41-A-1 ENGINE
 54% RPM
 FAR FIELD NOISE
 FREE FLOW
 PAGE 15



(FIGURE: PERCEIVED NOISE LEVEL WITH SMOOTH TONE CORRECTION (PNLT)
 (8 EQUAL LEVEL CONTOURS (PNDB)
 (NOISE SOURCE/SUBJECT: (OPERATION:) METEOROLOGY:) IDENTIFICATION:)
 (A-70 AIRCRAFT ((TEMP = 15 C) OMEGA 1.4
 (TF41-A-1 ENGINE ((BAR PRESS = .760 M HG) TEST 75-002-004
 (FAR FIELD NOISE ((FREE FLOW) RUN 01)
 ()) 06 MAY 75)
 ()) REL HUMID = 70 %)
 ()) PAGE 16)



IDENTIFICATION:)
 OMEGA 1.4)
 TEST 75-002-004)
 RUN 02)
 METEOROLOGY:)
 TEMP = 15 C)
 BAR PRESS = .760 M HG)
 REL HUMID = 70 %)
 OPERATION:)
 85% RPM)
 FREE FLOW)
 NOISE SOURCE/SUBJECT:)
 A-70 AIRCRAFT)
 TF41-A-1 ENGINE)
 FAR FIELD NOISE)



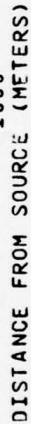
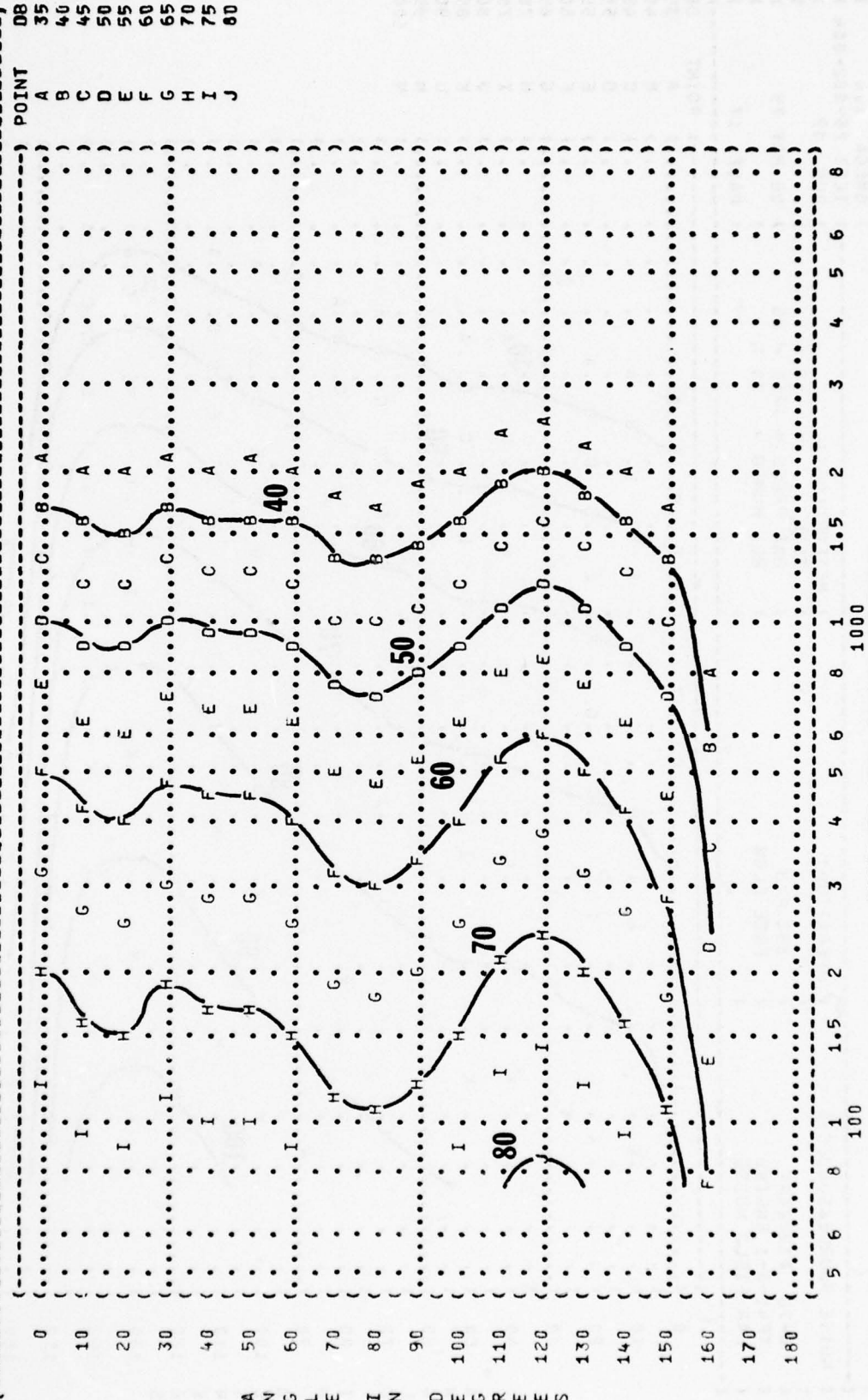
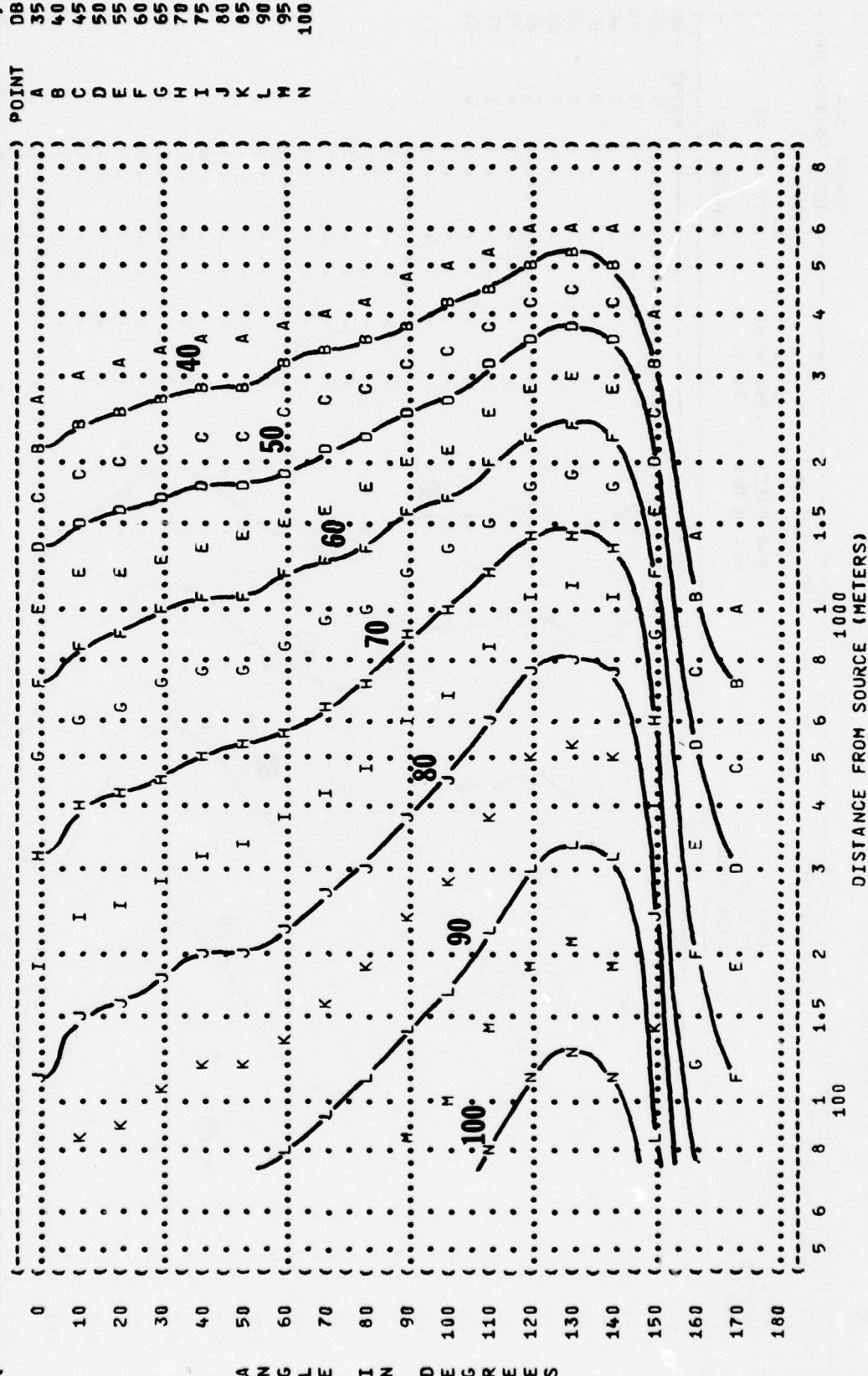


FIGURE: 9
 IDENTIFICATION: OMEGA 1.4
 TEST 75-002-004
 RUN 01
 METEOROLOGY: TEMP = 15 C
 BAR PRESS = .760 M HG
 REL HUMID = 70 %
 OPERATION: IDLE
 54% RPM
 FREE FLOW
 NOISE SOURCE/SUBJECT: A-7C AIRCRAFT
 TF41-A-1 ENGINE
 FAR FIELD NOISE
 06 MAY 75
 PAGE 17



A N G L E I N D E G R E E S

(FIGURE: PREFERRED SPEECH INTERFERENCE LEVEL (PSIL)
 (9 EQUAL LEVEL CONTOURS (DB)
 () IDENTIFICATION:
 () OMEGA 1.4
 () TEST 75-002-004
 () RUN 02
 () METEOROLOGY:
 () TEMP = 15 C
 () BAR PRESS = .760 M HG
 () REL HUMID = 70 %
 () 06 MAY 75
 () PAGE 17
 () NOISE SOURCE/SUBJECT:
 () OPERATION:
 () 85% RPM
 () FREE FLOW
 () A-70 AIRCRAFT
 () TF41-A-1 ENGINE
 () FAR FIELD NOISE



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( ( FIGURE: PREFERRED SPEECH INTERFERENCE LEVEL {PSIL}
( ( EQUAL LEVEL CONTOURS (DB)
( ( 9
( (-----
( ( NOISE SOURCE/SUBJECT: ( OPERATION: ) METEOROLOGY:
( ( ( ( ( TEMP = 15 C
( ( A-7D AIRCRAFT ( MILITARY POWER ) BAR PRESS = .760 M HG
( ( TF41-A-1 ENGINE ( 99.5% RPM ) REL HUMID = 70 %
( ( FAR FIELD NOISE ( FREE FLOW )
( (-----
( ( IDENTIFICATION: )
( ( ) OMEGA 1.4
( ( ) TEST 75-002-051
( ( ) RUN 01
( ( ) 20 MAY 75
( ( ) PAGE 17
( (-----

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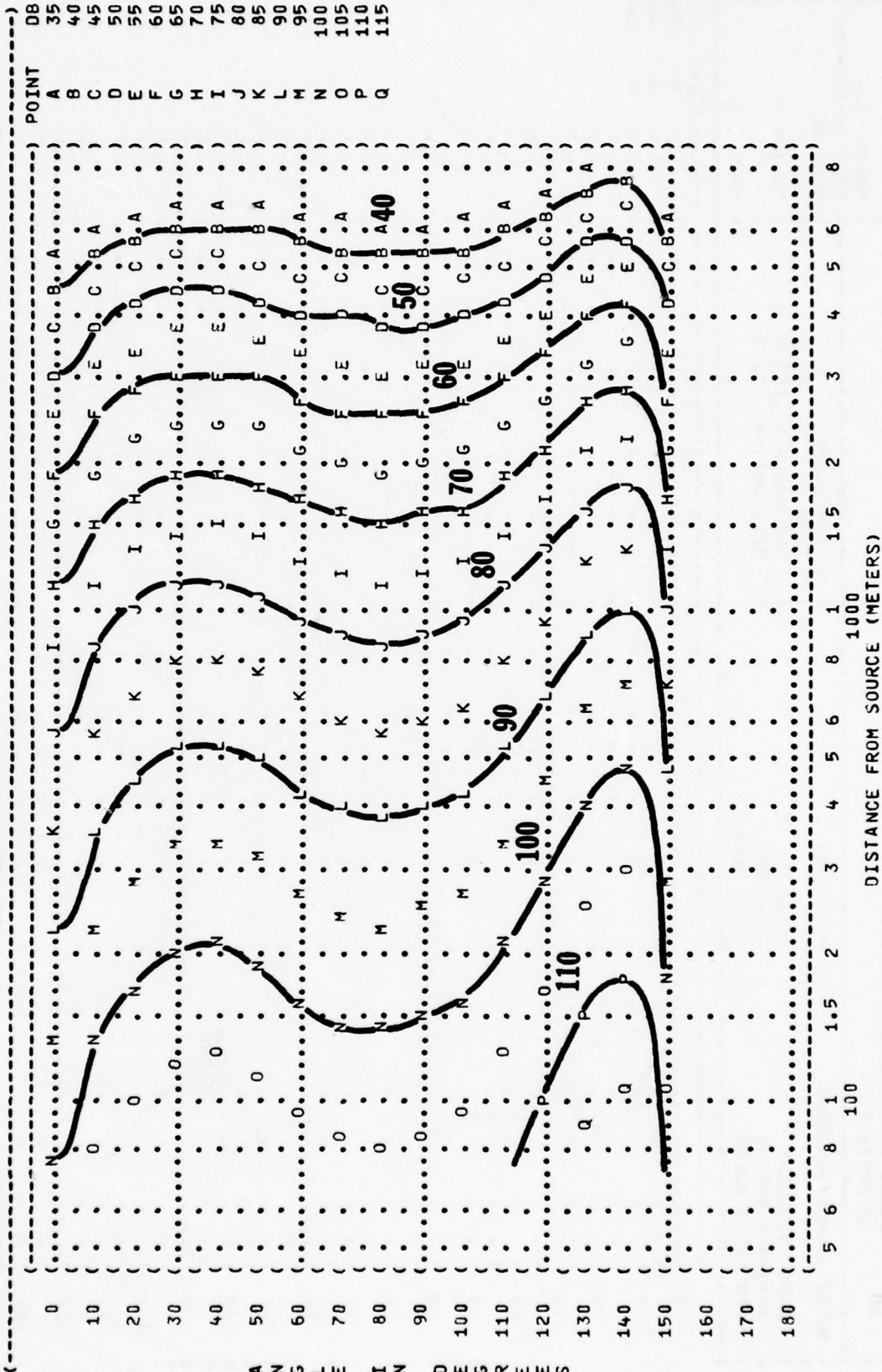


FIGURE: MAXIMUM PERMISSIBLE TIME (T) FOR ONE EXPOSURE PER DAY (AFR 161-35, JULY 73)

IDENTIFICATION:

10

EQUAL TIME CONTOURS (MINUTES)

NO PROTECTION

NOISE SOURCE/SUBJECT:

OPERATION:

METEOROLOGY:

TEMP = 15 C

BAR PRESS = .760 M HG

REL HUMID = 70 %

A-70 AIRCRAFT

TF41-A-1 ENGINE

54% RPM

FREE FLOW

OMEGA 1.4

TEST 75-002-004

RUN 01

06 MAY 75

PAGE 7

POINT MIN

A 960

B 480

C 240

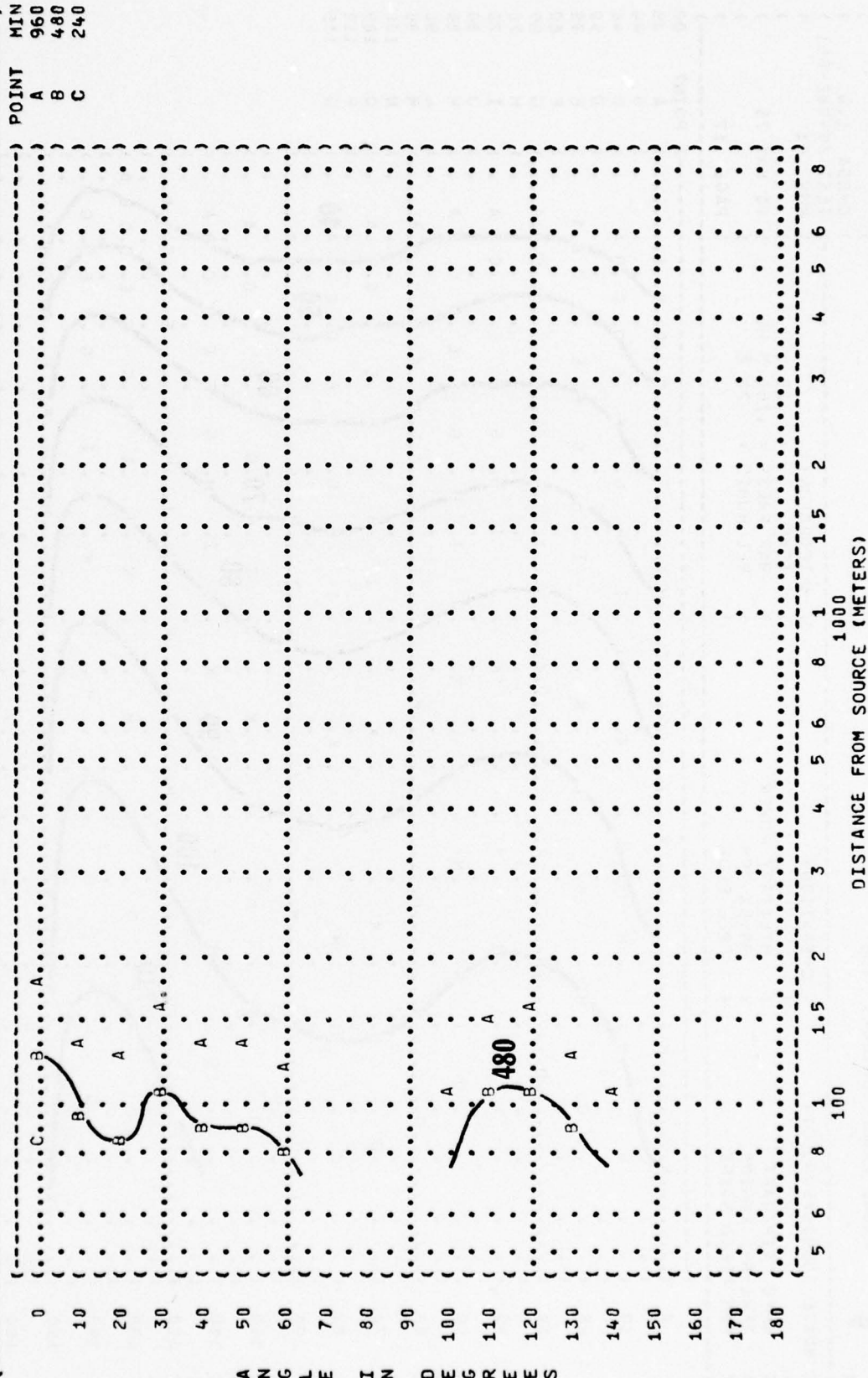


FIGURE: MAXIMUM PERMISSIBLE TIME (T) FOR ONE EXPOSURE PER DAY (AFR 161-35, JULY 73)

IDENTIFICATION:

OMEGA 1.4

TEST 75-002-004

RUN 01

06 MAY 75

PAGE 8

NOISE SOURCE/SUBJECT:

OPERATION:

METEOROLOGY:

TEMP = 15 C

BAR PRESS = .760 M HG

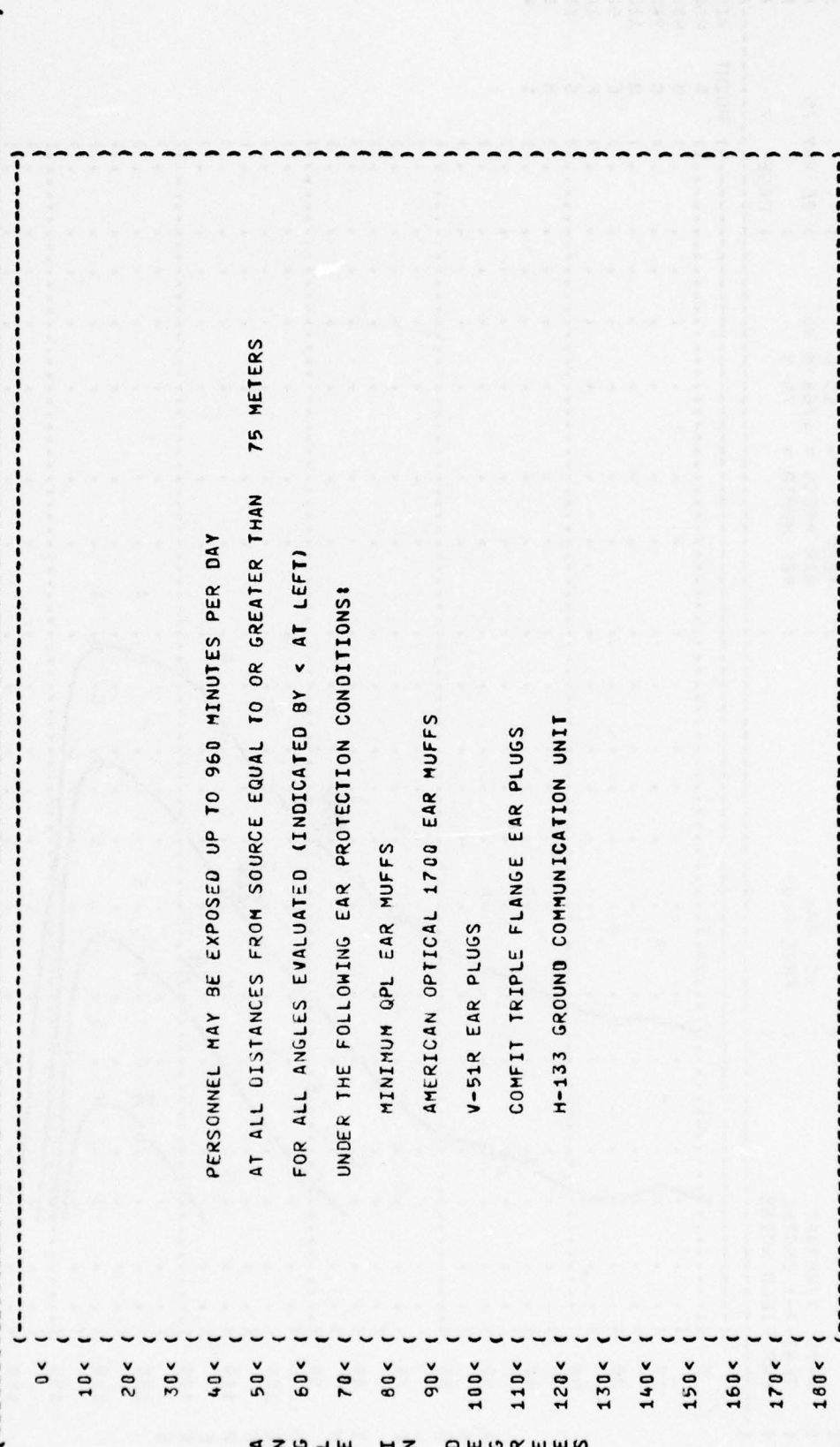
REL HUMID = 70 %

A-70 AIRCRAFT

IDLE

54% RPM

FREE FLOW



DISTANCE FROM SOURCE (METERS)

100

1000

FIGURE:	MAXIMUM PERMISSIBLE TIME (T) FOR ONE EXPOSURE PER DAY (AFR 161-35, JULY 73)	IDENTIFICATION:
10	EQUAL TIME CONTOURS (MINUTES)	
	NO PROTECTION	OMEGA 1.4
		TEST 75-002-004
		RUN 02
NOISE SOURCE/SUBJECT:	OPERATION:	
A-70 AIRCRAFT	85% RPM	METEOROLOGY:
TF41-A-1 ENGINE	FREE FLOW	TEMP = 15 C
FAR FIELD NOISE		BAR PRESS = .760 M HG
		REL HUMID = 70 %
		PAGE 7

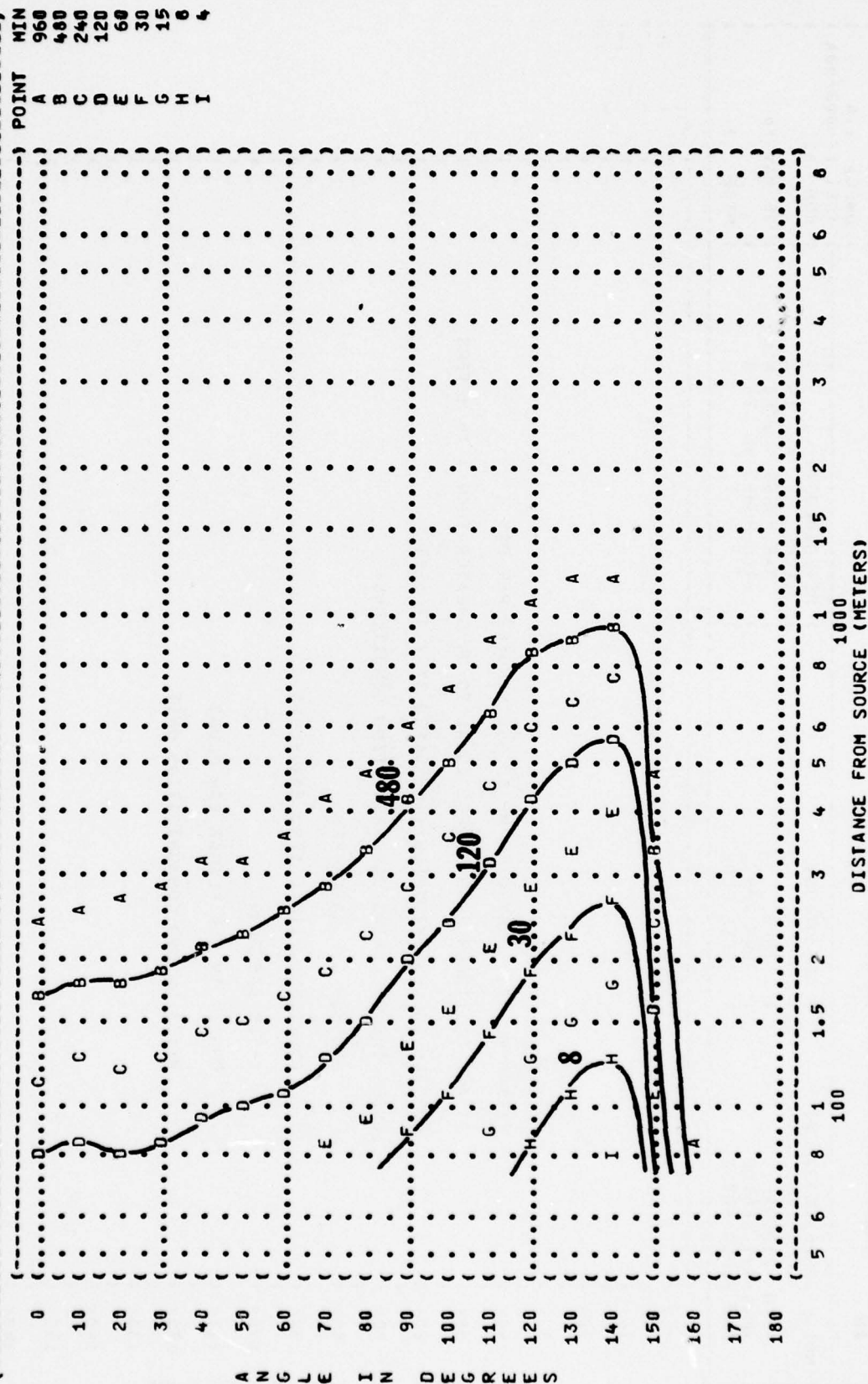
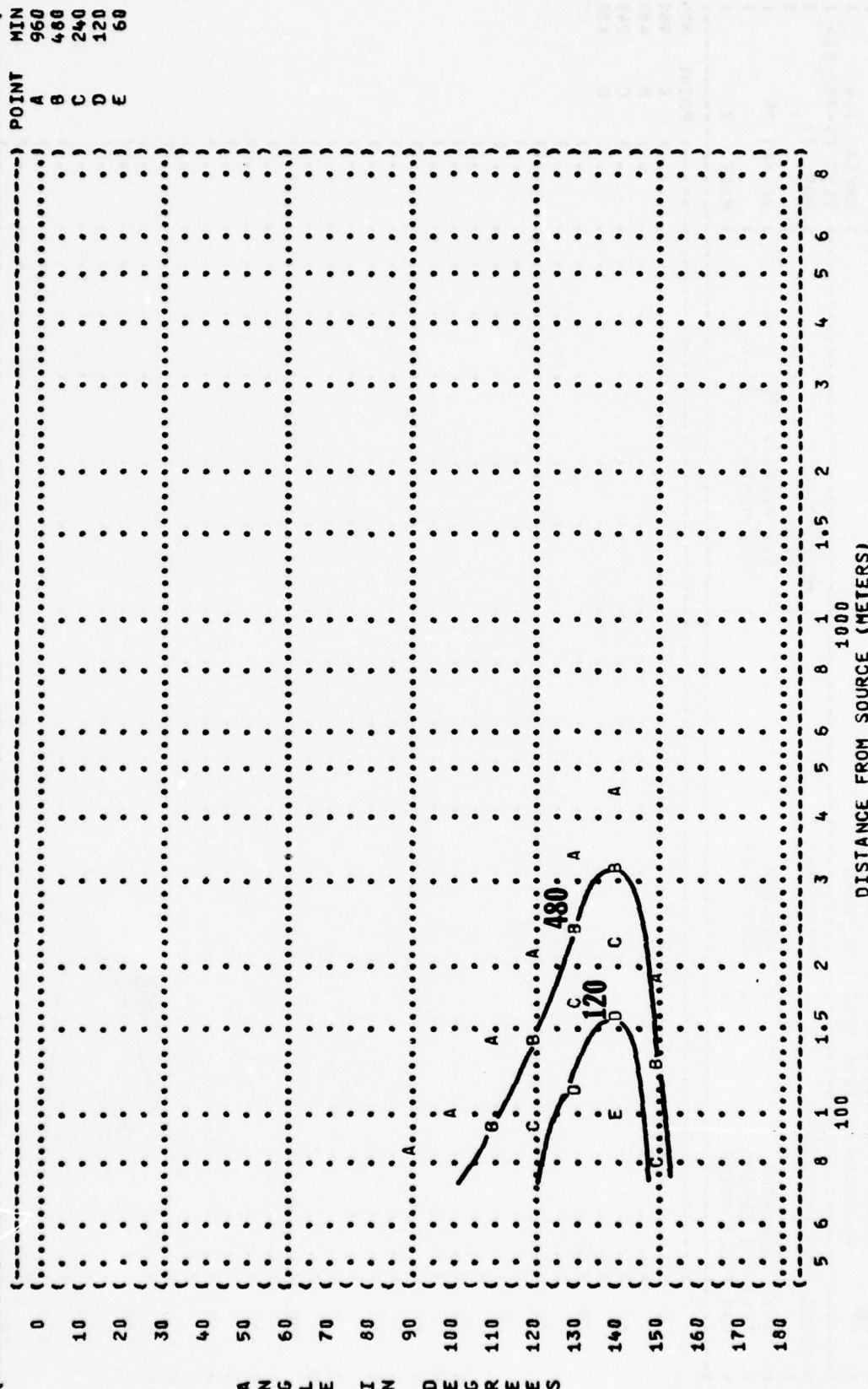


FIGURE: MAXIMUM PERMISSIBLE TIME (T) FOR ONE EXPOSURE PER DAY (AFR 161-35, JULY 73) IDENTIFICATION:
 10 EQUAL TIME CONTOURS (MINUTES)
 MINIMUM QPL EAR MUFFS
 NOISE SOURCE/SUBJECT: OPERATION: METEOROLOGY: TEMPERATURE = 15 C
 A-70 AIRCRAFT 85% RPM BAR PRESS = .760 M HG
 TF41-A-1 ENGINE FREE FLOW REL HUMID = 70 %
 FAR FIELD NOISE PAGE 8



POINT	MIN
A	960
B	480
C	240

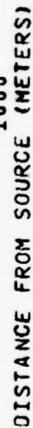


FIGURE: MAXIMUM PERMISSIBLE TIME (T) FOR ONE EXPOSURE PER DAY (AFR 161-35, JULY 73)

10 EQUAL TIME CONTOURS (MINUTES)

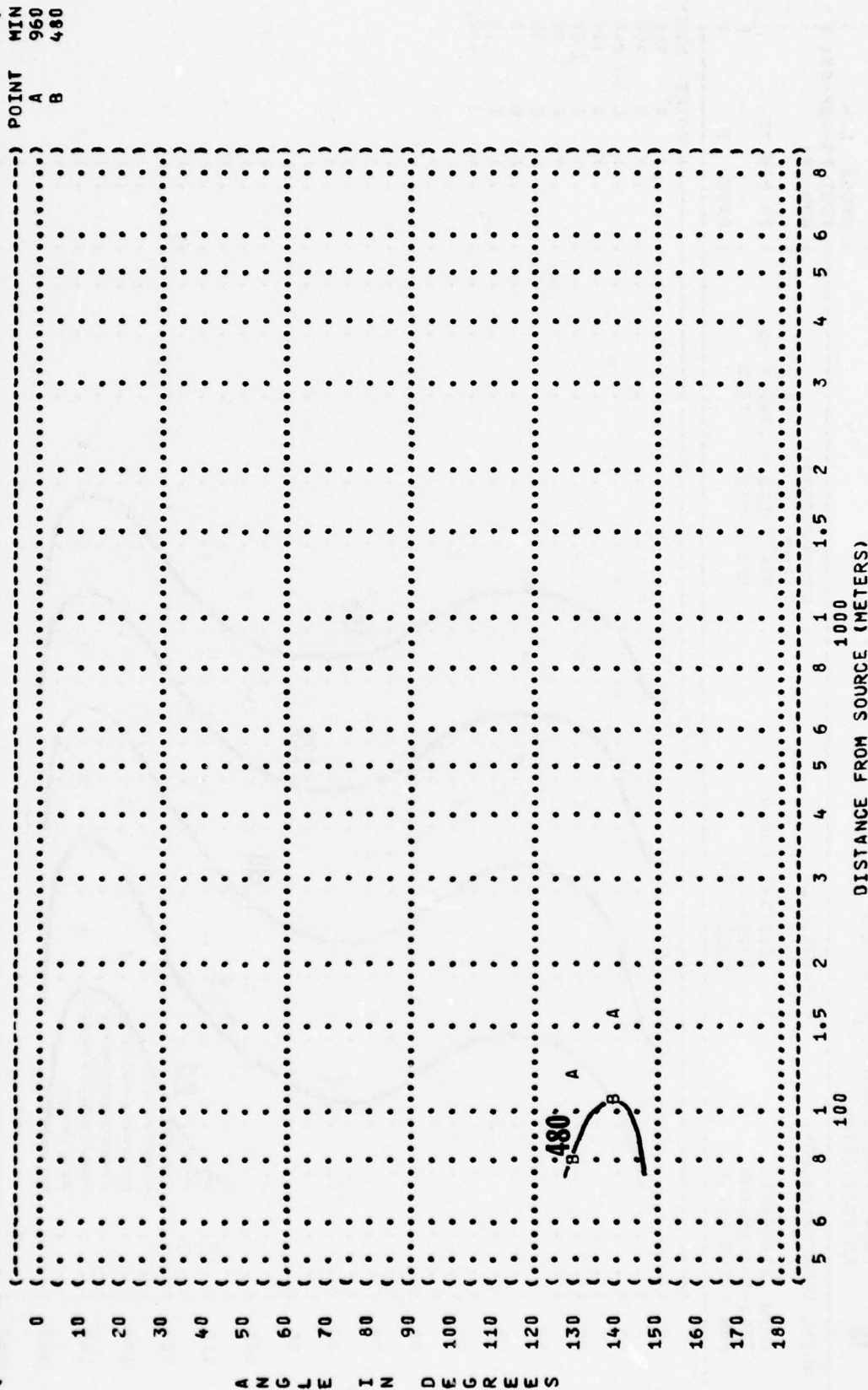
H-133 GROUND COMMUNICATION UNIT

NOISE SOURCE/SUBJECT: (OPERATION:) METEOROLOGY: (TEMP = 15 C) OMEGA 1.4

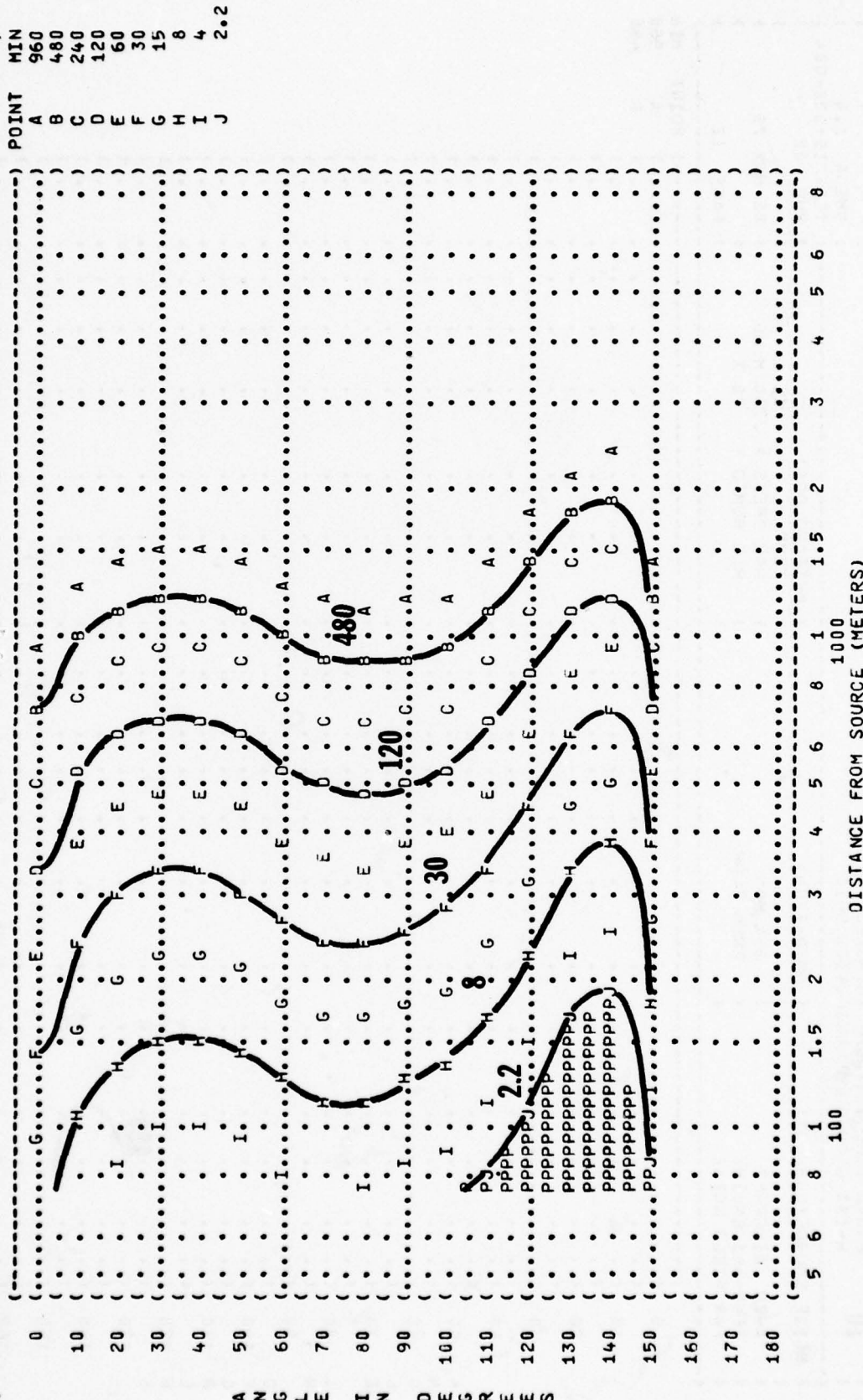
(A-70 AIRCRAFT (85% RPM) BAR PRESS = .760 M HG) TEST 75-002-004

(TF41-A-1 ENGINE (FREE FLOW) REL HUMID = 70 %) RUN 02

(FAR FIELD NOISE ()) PAGE 12



```
(-----)
( FIGURE: MAXIMUM PERMISSIBLE TIME (T) FOR ONE EXPOSURE PER DAY (AFR 161-35, JULY 73) ) IDENTIFICATION: )
( EQUAL TIME CONTOURS (MINUTES) ) )
( NO PROTECTION ) OMEGA 1.4 )
( ) TEST 75-002-051 )
( NOISE SOURCE/SUBJECT: ) METEOROLOGY: ) RUN 01 )
( ) TEMP = 15 C ) )
( A-7D AIRCRAFT ) MILITARY POWER ) BAR PRESS = .760 M HG ) 20 MAY 75 )
( TF41-A-1 ENGINE ) 99.5% RPM ) REL HUMID = 70 % ) )
( FAR FIELD NOISE ) FREE FLOW ) PAGE 7 )
(-----)
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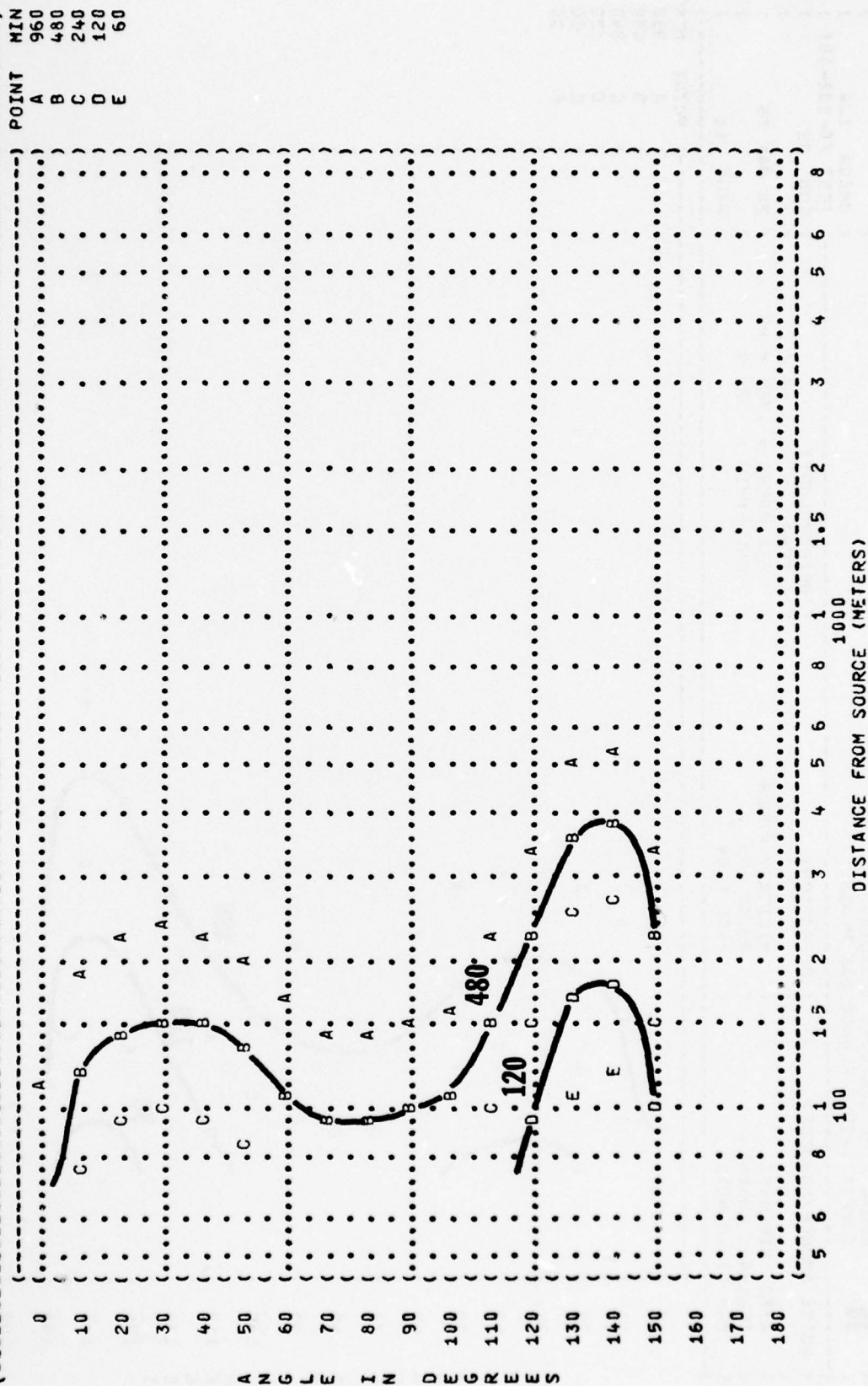


ADDITIONAL EAR PROTECTION REQUIRED.

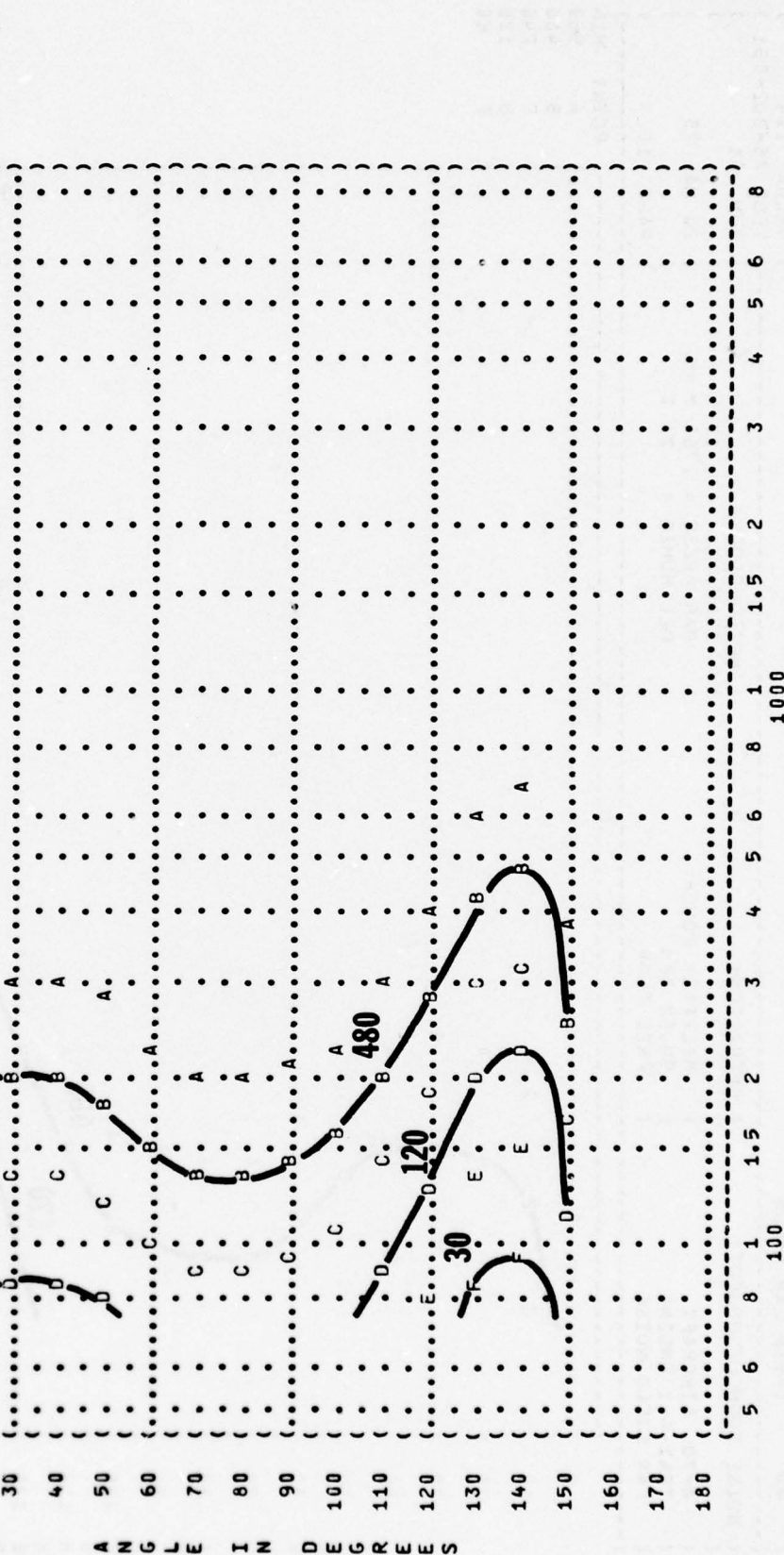
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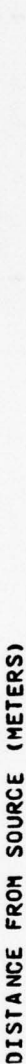


FIGURE:	MAXIMUM PERMISSIBLE TIME (T) FOR ONE EXPOSURE PER DAY (AFR 161-35, JULY 73)	IDENTIFICATION:
10	EQUAL TIME CONTOURS (MINUTES)	OMEGA 1.4
	V-51R EAR PLUGS	TEST 75-002-051
	NOISE SOURCE/SUBJECT:	RUN 01
	(OPERATION:	METEOROLOGY:
	(MILITARY POWER	TEMP = 15 C
	(99.5% RPM	BAR PRESS = .760 M HG
	(FREE FLOW	REL HUMID = 70 %
		PAGE 10
		POINT
		MIN
		MIN
0	A	A
10	B	B
20	C	C
	D	D
	E	E



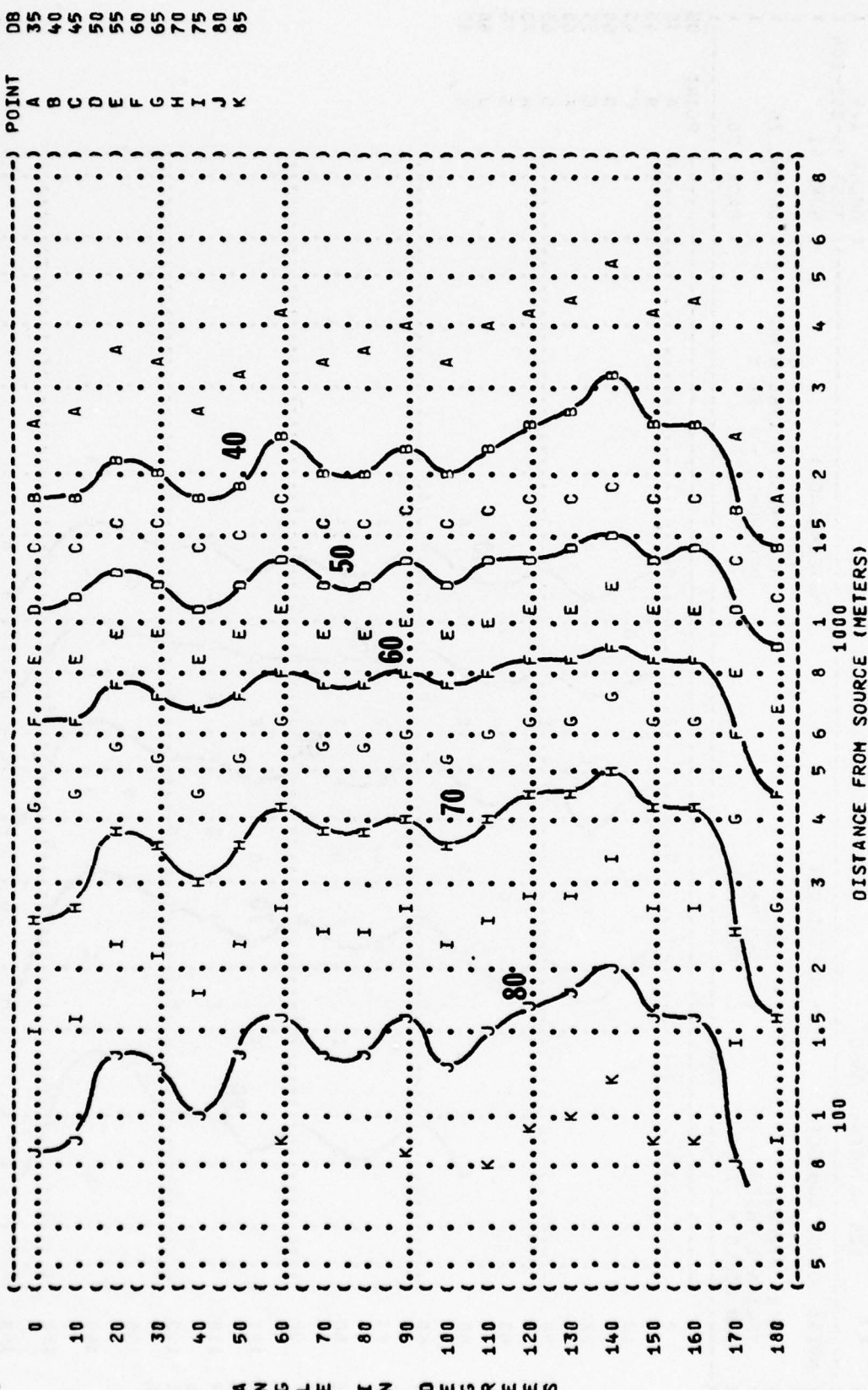
FAR FIELD NOISE (FREE FLOW) PAGE 11



[illegible]

53

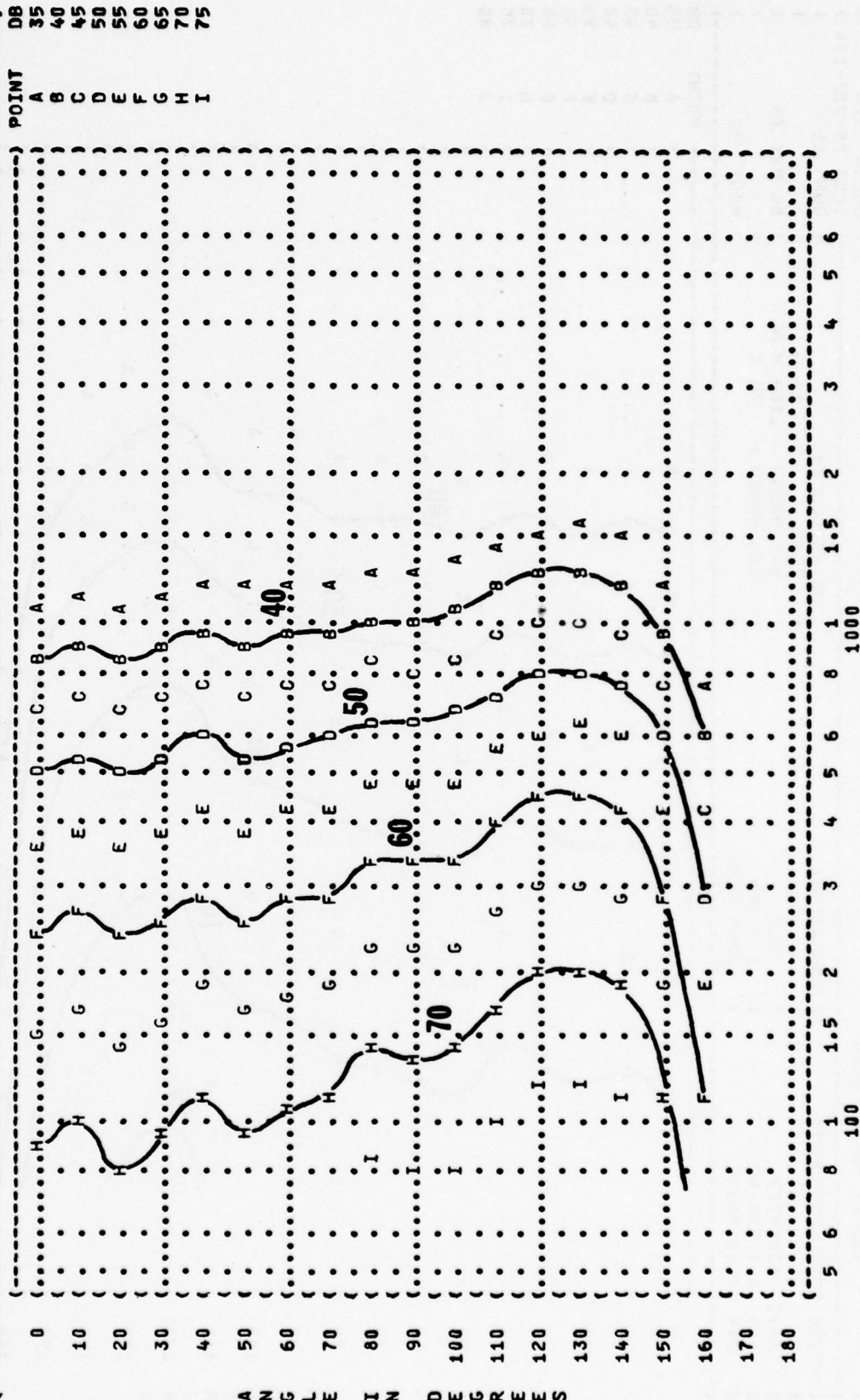
(FIGURE: SOUND PRESSURE LEVEL (SPL)
 (11 EQUAL LEVEL CONTOURS (DB)
 (63 HZ OCTAVE BAND
 (NOISE SOURCE/SUBJECT: (OPERATION:
 (A-70 AIRCRAFT (IDLE
 (TF41-A-1 ENGINE (54% RPM
 (FAR FIELD NOISE (FREE FLOW
 (METEOROLOGY: (TEMP = 15 C
 (BAR PRESS = .760 M HG
 (REL HUMID = 70 %
 (RUN 01
 (06 MAY 75
 (PAGE 19
 (IDENTIFICATION: (OMEGA 1.4
 (TEST 75-002-004
 (



A N G
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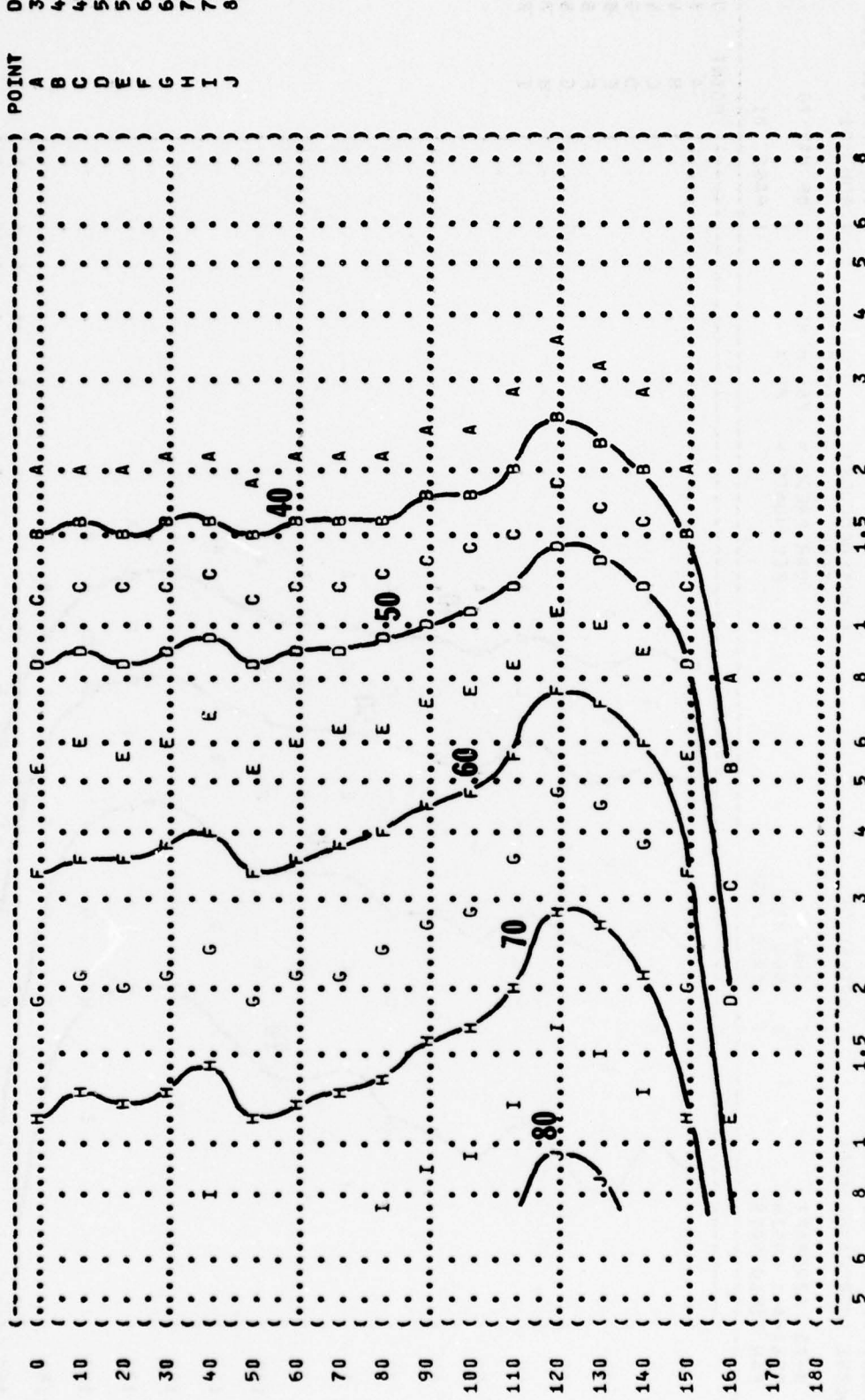
DISTANCE FROM SOURCE (METERS)

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( ( FIGURE: SOUND PRESSURE LEVEL {SPL} ) IDENTIFICATION: )
( ( EQUAL LEVEL CONTOURS (DB) ) )
( ( 11 ) OMEGA 1.4 )
( ( 250 HZ OCTAVE BAND ) TEST 75-002-004 )
( ( NOISE SOURCE/SUBJECT: ) METEOROLOGY: )
( ( ) TEMP = 15 C )
( ( A-70 AIRCRAFT ) BAR PRESS = .760 M HG )
( ( TF41-A-1 ENGINE ) 54% RPM )
( ( FAR FIELD NOISE ) FREE FLOW )
( ( ) PAGE 21 )
```



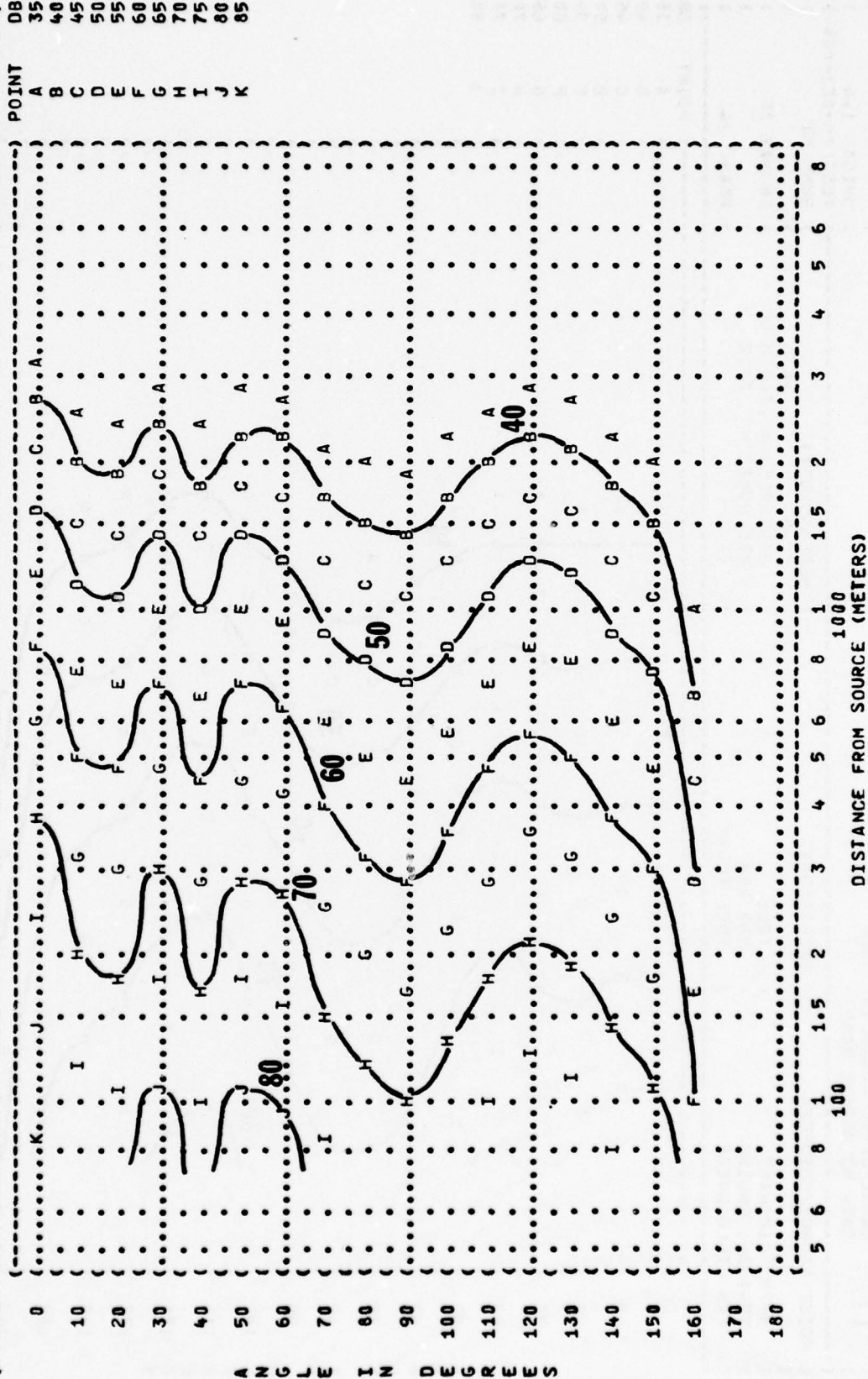
DISTANCE FROM SOURCE (METERS)

----- POINT

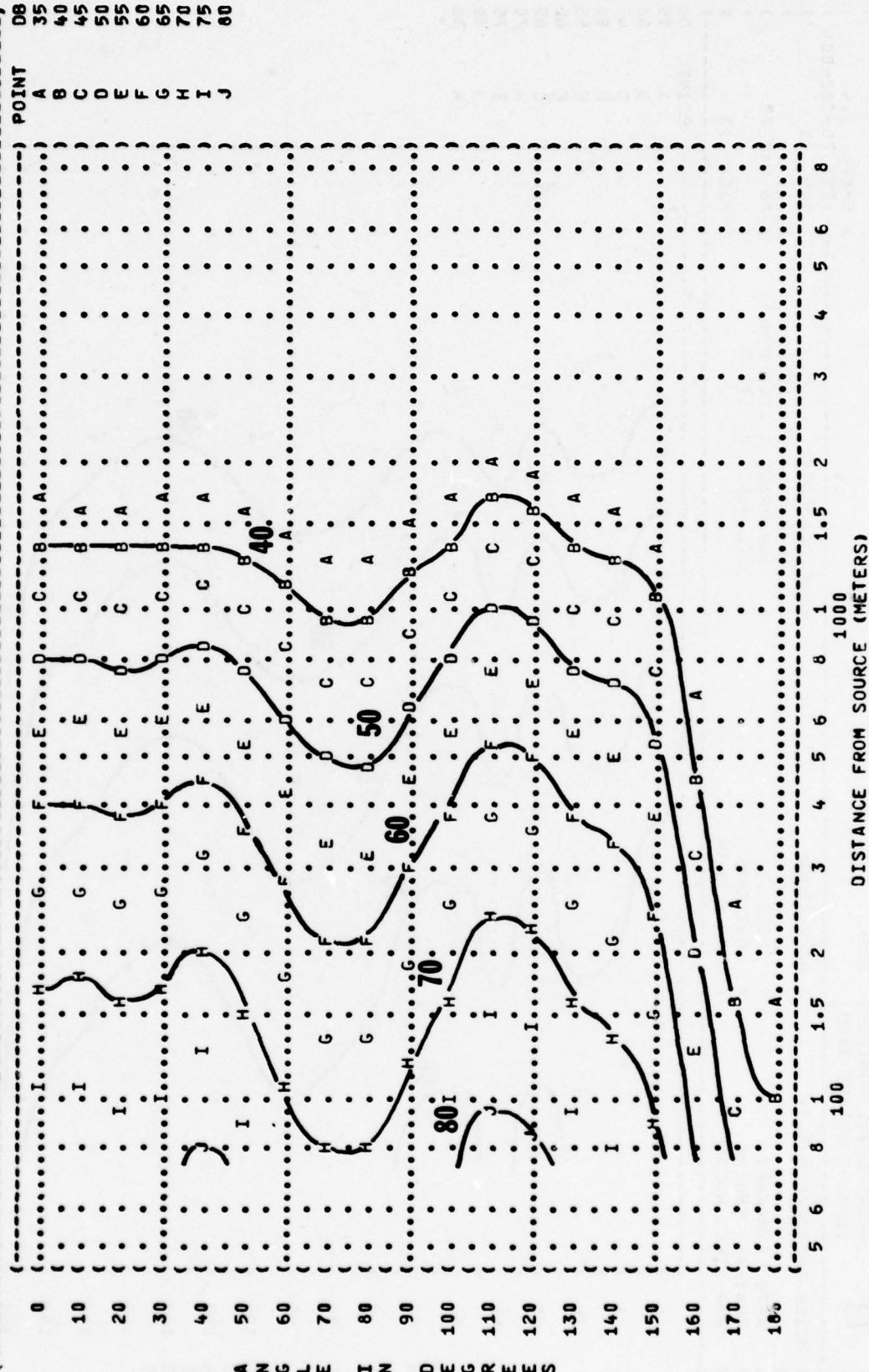


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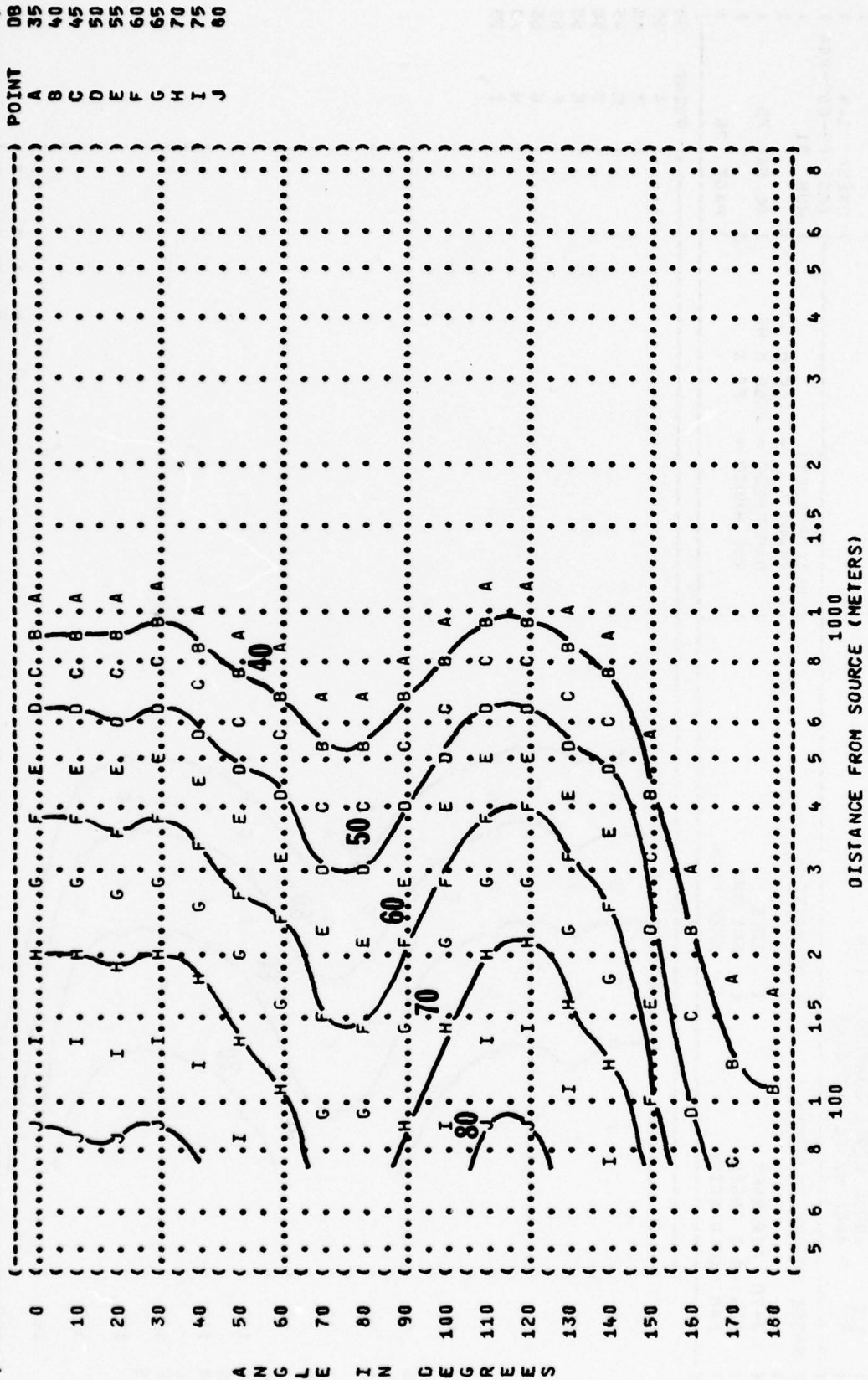
(FIGURE: SOUND PRESSURE LEVEL (SPL))
 (11 EQUAL LEVEL CONTOURS (DB))
 (1000 HZ OCTAVE BAND)
 (NOISE SOURCE/SUBJECT:)
 (A-7D AIRCRAFT)
 (TF41-A-1 ENGINE)
 (FAR FIELD NOISE)
 (OPERATION:)
 (IDLE)
 (54% RPM)
 (FREE FLOW)
 (METEOROLOGY:)
 (TEMP = 15 C)
 (BAR PRESS = .760 M HG)
 (REL HUMID = 70 %)
 (IDENTIFICATION:)
 (OMEGA 1.4)
 (TEST 75-002-004)
 (RUN 01)
 (06 MAY 75)
 (PAGE 23)



(FIGURE: SOUND PRESSURE LEVEL (SPL)
 (11 EQUAL LEVEL CONTOURS (DB)
 (2000 HZ OCTAVE BAND
 (NOISE SOURCE/SUBJECT:
 ((OPERATION:
 ((IDLE
 ((54% RPM
 ((FREE FLOW
 (A-70 AIRCRAFT
 (TF41-A-1 ENGINE
 (FAR FIELD NOISE
 (METEOROLOGY:
 (TEMP = 15 C
 (BAR PRESS = .760 M HG
 (REL HUMID = 70 %
 (IDENTIFICATION:
 (OMEGA 1.4
 (TEST 75-002-004
 (RUN 01
 (06 MAY 75
 (PAGE 24
 (POINT DB
 (A 35
 (B 40
 (C 45
 (D 50
 (E 55
 (F 60
 (G 65
 (H 70
 (I 75
 (J 80



(FIGURE: SOUND PRESSURE LEVEL (SPL)
 (11 EQUAL LEVEL CONTOURS (DB)
 (4000 HZ OCTAVE BAND
 (NOISE SOURCE/SUBJECT: (OPERATION:
 (A-70 AIRCRAFT (IDLE
 (IF41-A-1 ENGINE (54% RPM
 (FAR FIELD NOISE (FREE FLOW
 (METEOROLOGY: (TEMP = 15 C
 (BAR PRESS = .760 H HG
 (REL HUMID = 70 %
 (PAGE 25
 (IDENTIFICATION:
 (OMEGA 1.4
 (TEST 75-002-004
 (RUN 01
 (06 MAY 75
 (POINT DB
 (A 35
 (B 40
 (C 45
 (D 50
 (E 55
 (F 60
 (G 65
 (H 70
 (I 75
 (J 80



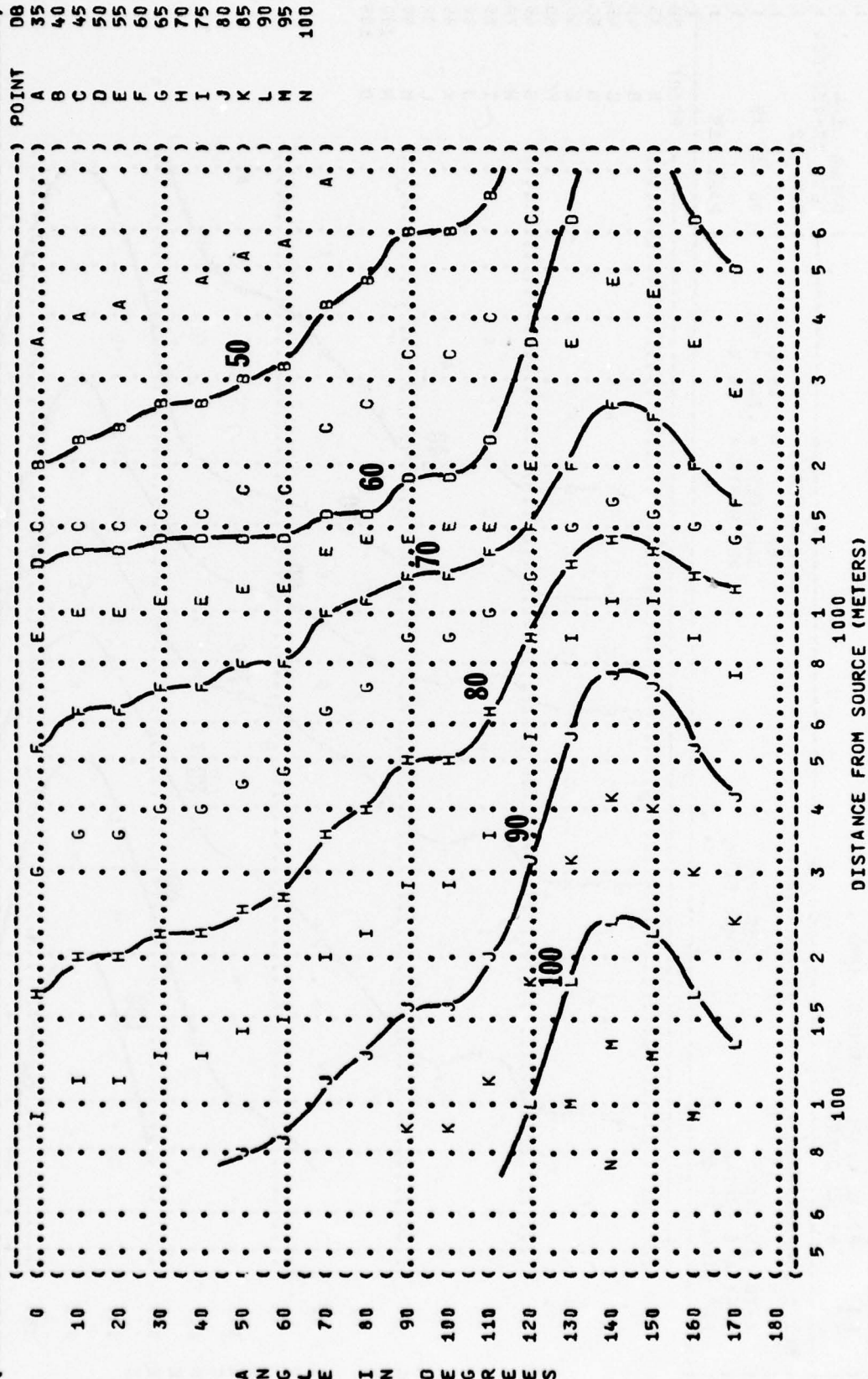
ANGLE IN DEGREES



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( { FIGURE: SOUND PRESSURE LEVEL {SPL}
( { 11 EQUAL LEVEL CONTOURS (DB)
( { 31.5 HZ OCTAVE BAND
( {
( { NOISE SOURCE/SUBJECT: ( OPERATION:
( { (
( { A-7D AIRCRAFT ( 85% RPM
( { TF41-A-1 ENGINE ( FREE FLOW
( { FAR FIELD NOISE (
( {
( { METEOROLOGY:
( { TEMP = 15 C
( { BAR PRESS = .760 M HG
( { REL HUMID = 70 %
( {
( { IDENTIFICATION:
( { OMEGA 1.4
( { TEST 75-002-004
( { RUN 02
( { 06 MAY 75
( { PAGE 18
( {

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10



64

IDENTIFICATION:
OMEGA 1.4

GA 1.4

TEST 75-002-004

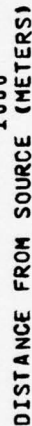
10 METEOROLOGY:

TEMP = 15 C

FREE FLOW

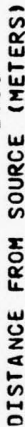
POINT

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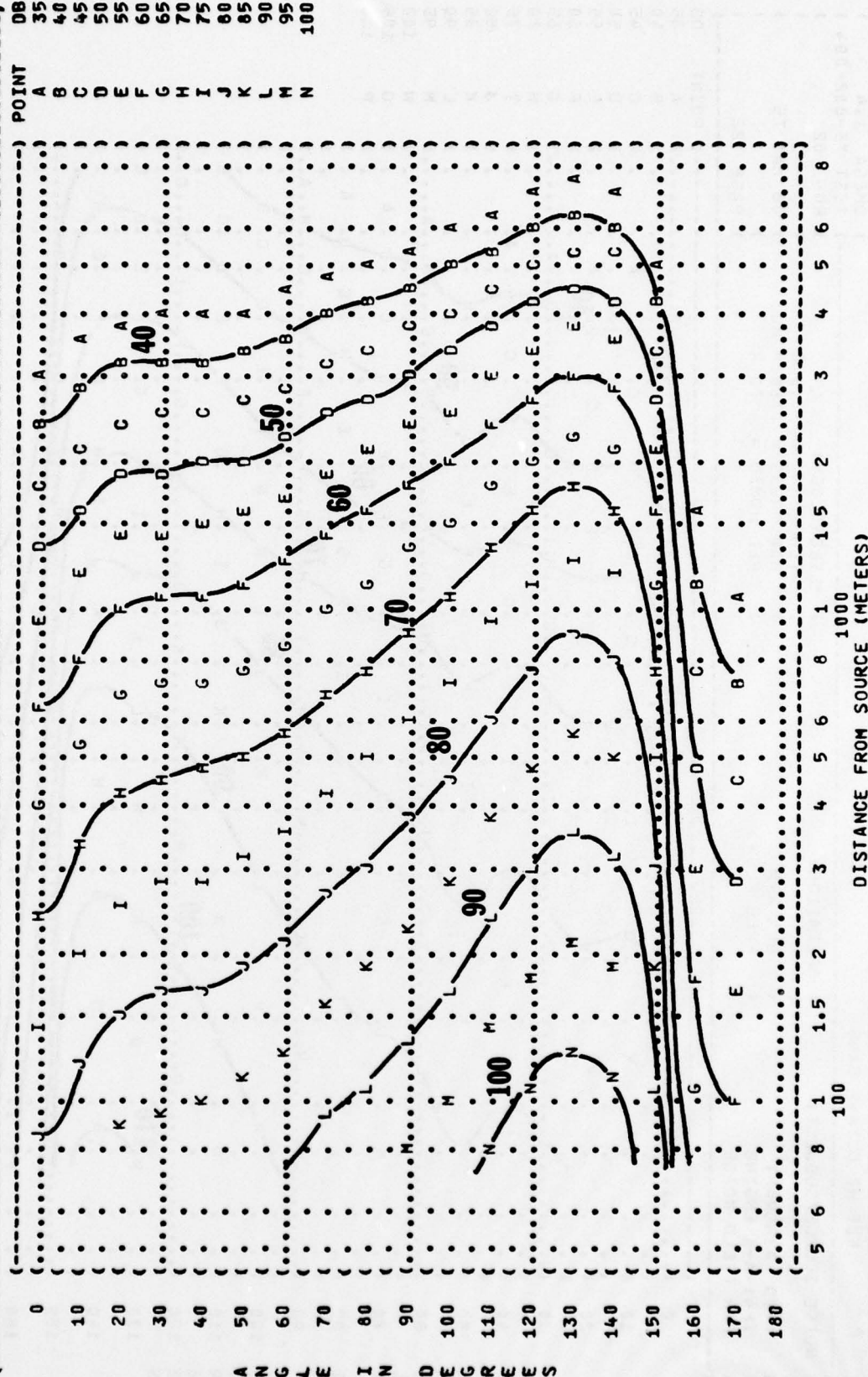


AZUL HZ DEUTERUS

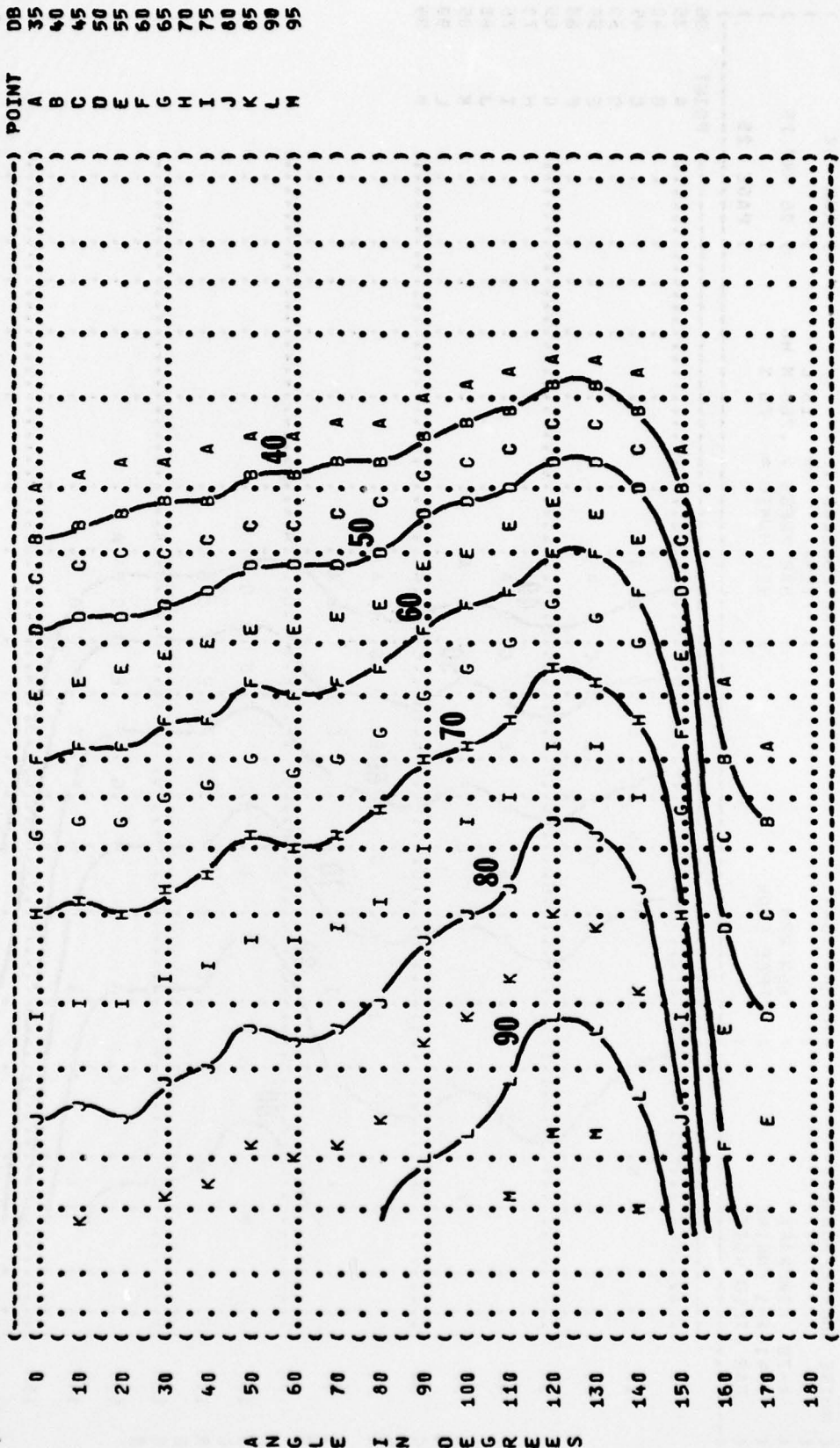
PAGE 21



(FIGURE: SOUND PRESSURE LEVEL (SPL)
 (11 EQUAL LEVEL CONTOURS (DB)
 (1000 HZ OCTAVE BAND
 (NOISE SOURCE/SUBJECT: (OPERATION:
 (A-70 AIRCRAFT (85% RPM
 (TF41-A-1 ENGINE (FREE FLOW
 (FAR FIELD NOISE ()
 () IDENTIFICATION:
 () OMEGA 1.4
 (TEST 75-002-004
 () RUN 02
 () 06 MAY 75
 () PAGE 23
 () METEOROLOGY:
 () TEMP = 15 C
 () BAR PRESS = .760 M HG
 () REL HUMID = 70 %



(FIGURE: SOUND PRESSURE LEVEL (SPL))
 (11 EQUAL LEVEL CONTOURS (DB))
 (2000 HZ OCTAVE BAND)
 (NOISE SOURCE/SUBJECT:)
 (OPERATION:)
 (A-70 AIRCRAFT)
 (TF41-A-1 ENGINE)
 (FAR FIELD NOISE)
 (METEOROLOGY:)
 (TEMP = 15 C)
 (BAR PRESS = .760 M HG)
 (REL HUMID = 70 %)
 (IDENTIFICATION:)
 (OMEGA 1.4)
 (TEST 75-002-004)
 (RUN 02)
 (06 MAY 75)
 (PAGE 24)

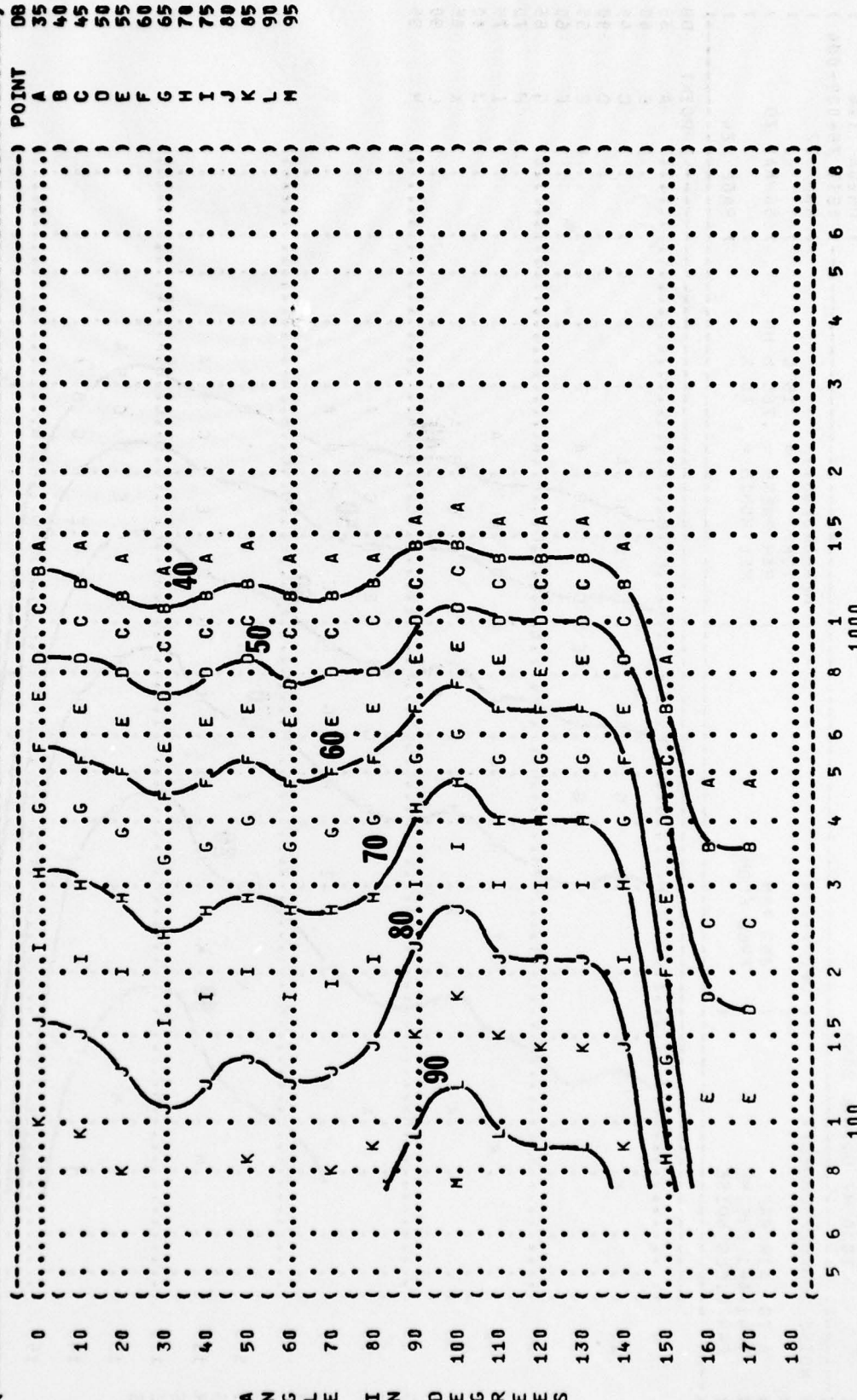


DISTANCE FROM SOURCE (METERS)
 5 6 8 1 1.5 2 3 4 5 6 8 1000

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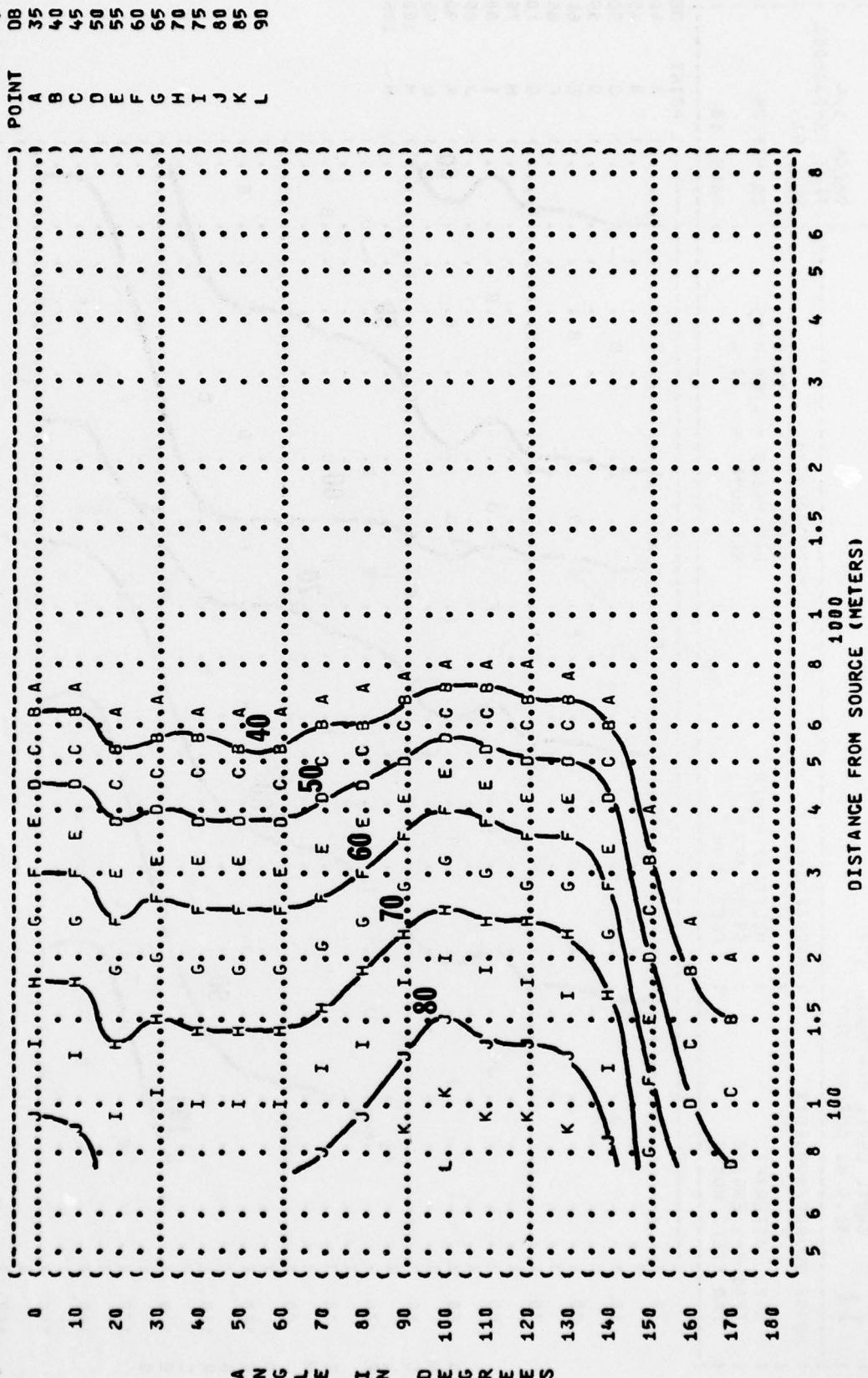
(FIGURE: SOUND PRESSURE LEVEL (SPL)
 (11 EQUAL LEVEL CONTOURS (DB)
 (4000 HZ OCTAVE BAND
 (NOISE SOURCE/SUBJECT: (OPERATION:
 (A-70 AIRCRAFT (85% RPM
 (TF41-A-1 ENGINE (FREE FLOW
 (FAR FIELD NOISE (

) IDENTIFICATION:
) OMEGA 1.4
) TEST 75-002-004
) RUN 02
) METEOROLOGY:
) TEMP = 15 C
) BAR PRESS = .760 M HG
) REL HUMID = 70 %
) PAGE 25



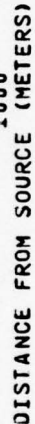
A N G L E I N D E G R E E S

(FIGURE: SOUND PRESSURE LEVEL (SPL)
 (11 EQUAL LEVEL CONTOURS (DB)
 (8000 HZ OCTAVE BAND
 (NOISE SOURCE/SUBJECT: (OPERATION:
 (A-70 AIRCRAFT (85% RPM
 (TF41-A-1 ENGINE (FREE FLOW
 (FAR FIELD NOISE ()
 () METEOROLOGY: = 15 C
 () TEMP = .760 M HG
 () BAR PRESS = 70 %
 () REL HUMID =
 () PAGE 26
 (IDENTIFICATION:
 ()
 () OMEGA 1.4
 () TEST 75-002-004
 () RUN 02
 () 06 MAY 75
 ()
 ()
 ()



ANGLE IN DEGREES

PAGE 18



IDENTIFICATION:
OMEGA 1.4

4.

TEST 75-002-051

1) METEOROLOGY:

01

09 H

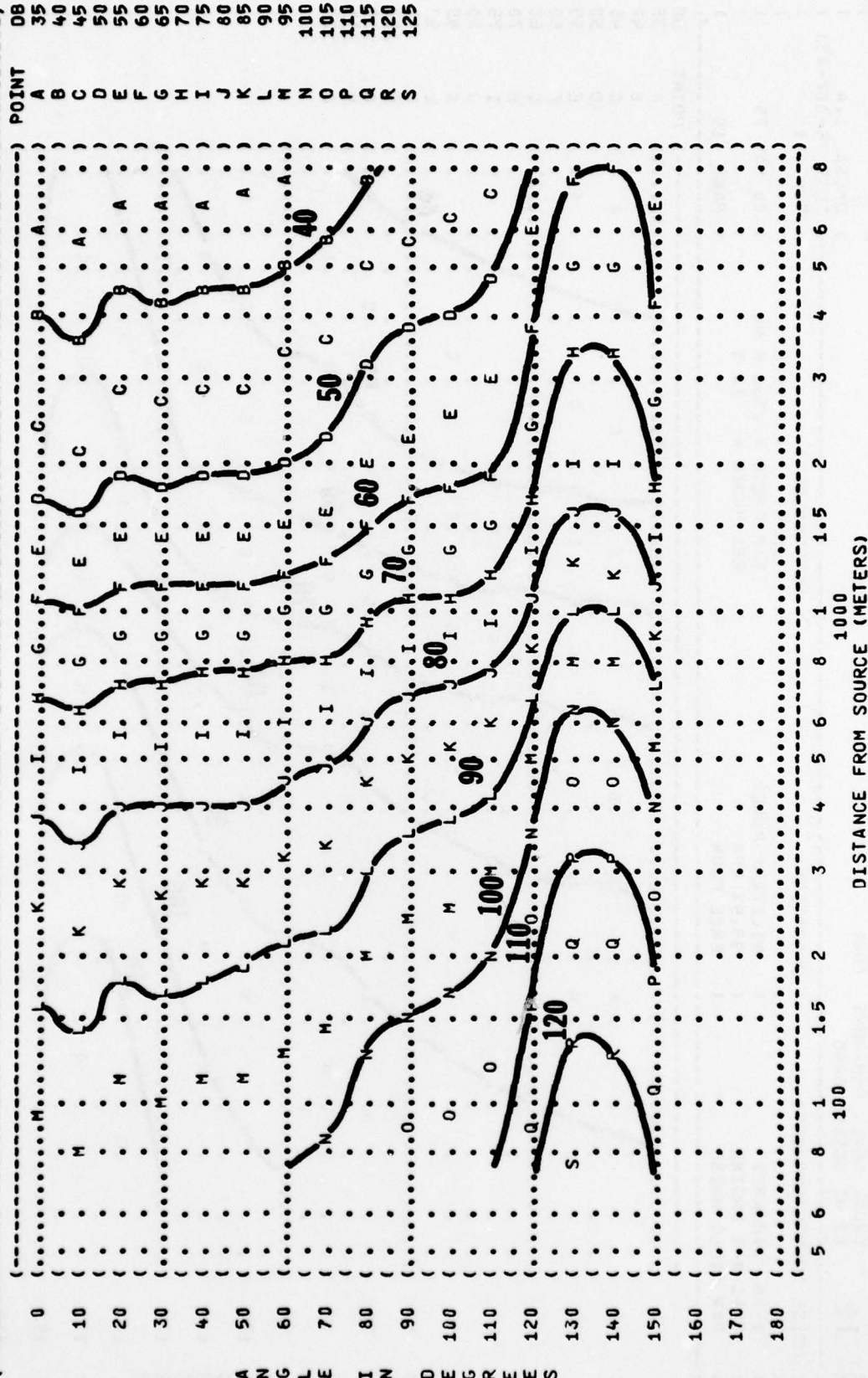
51

REL HUMID = 70 %

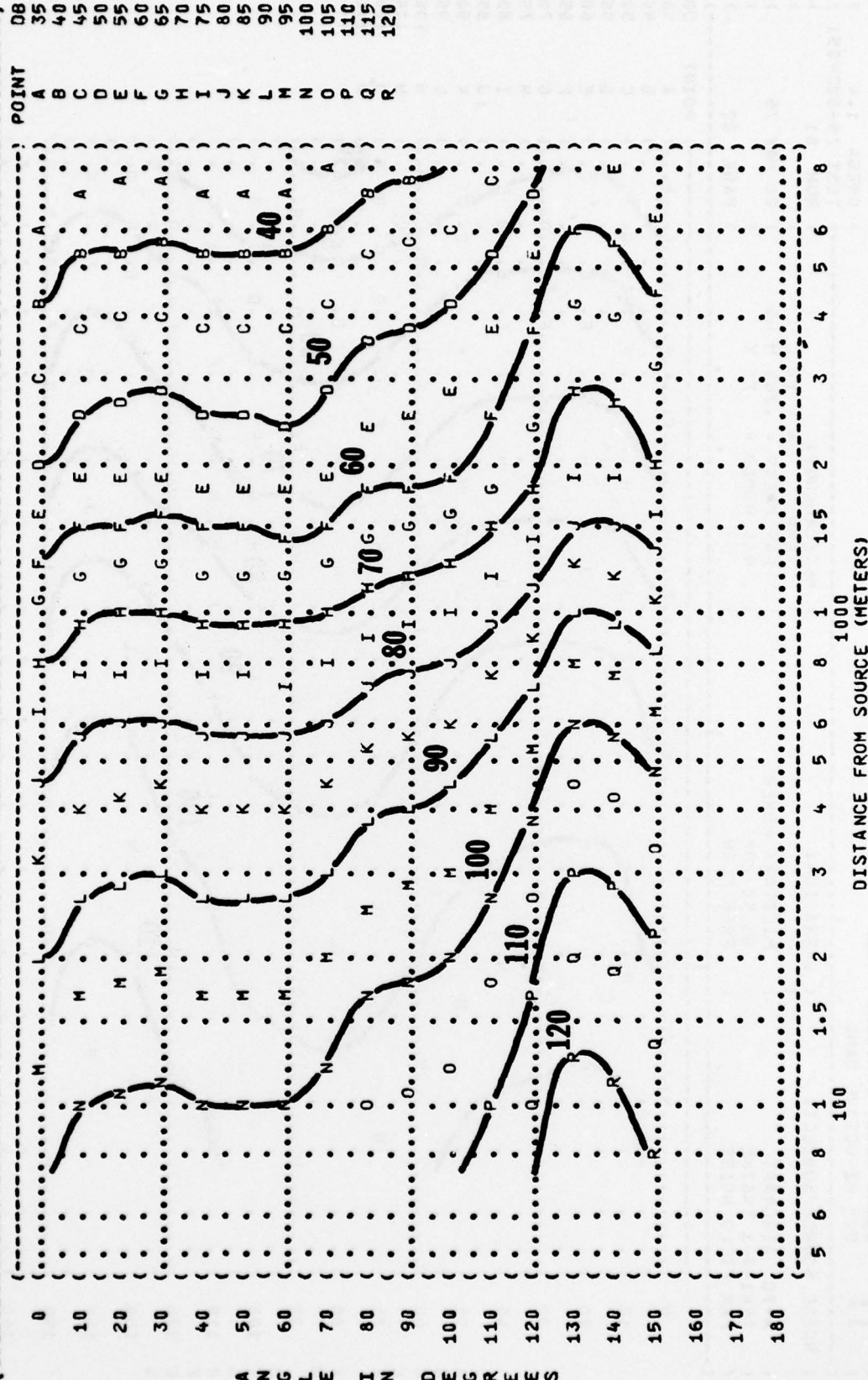
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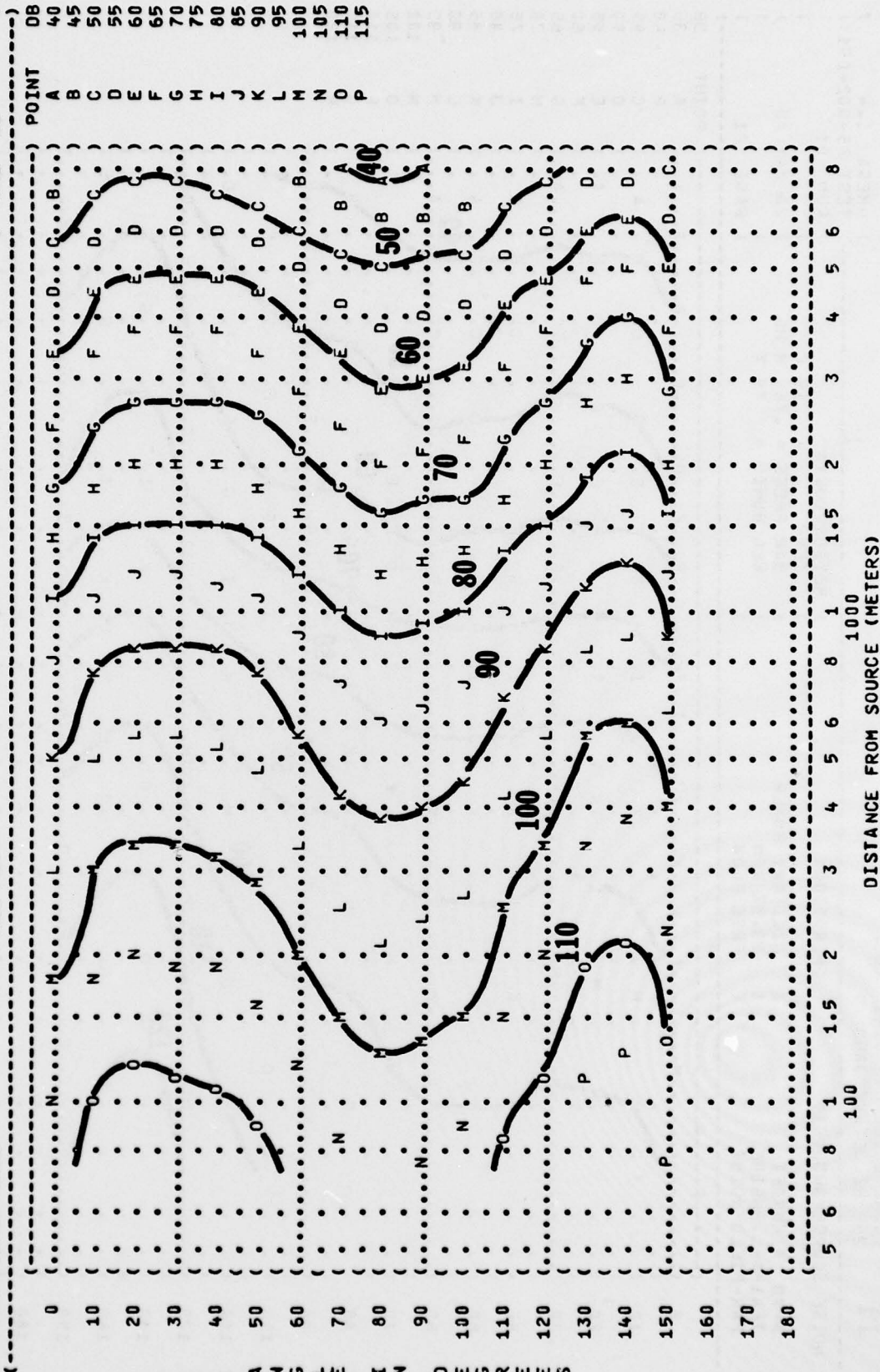


(FIGURE: SOUND PRESSURE LEVEL (SPL)
 (EQUAL LEVEL CONTOURS (DB)
 (11 125 HZ OCTAVE BAND
 (NOISE SOURCE/SUBJECT:
 () IDENTIFICATION:
 () OMEGA 1.4
 (TEST 75-002-051
 () RUN 01
 () METEOROLOGY:
 () TEMP = 15 C
 () BAR PRESS = .760 M HG
 () REL HUMID = 70 %
 () OPERATION:
 () MILITARY POWER
 () 99.5% RPM
 () FREE FLOW
 () A-7D AIRCRAFT
 () TF41-A-1 ENGINE
 () FAR FIELD NOISE
 () 20 MAY 75
 () PAGE 20

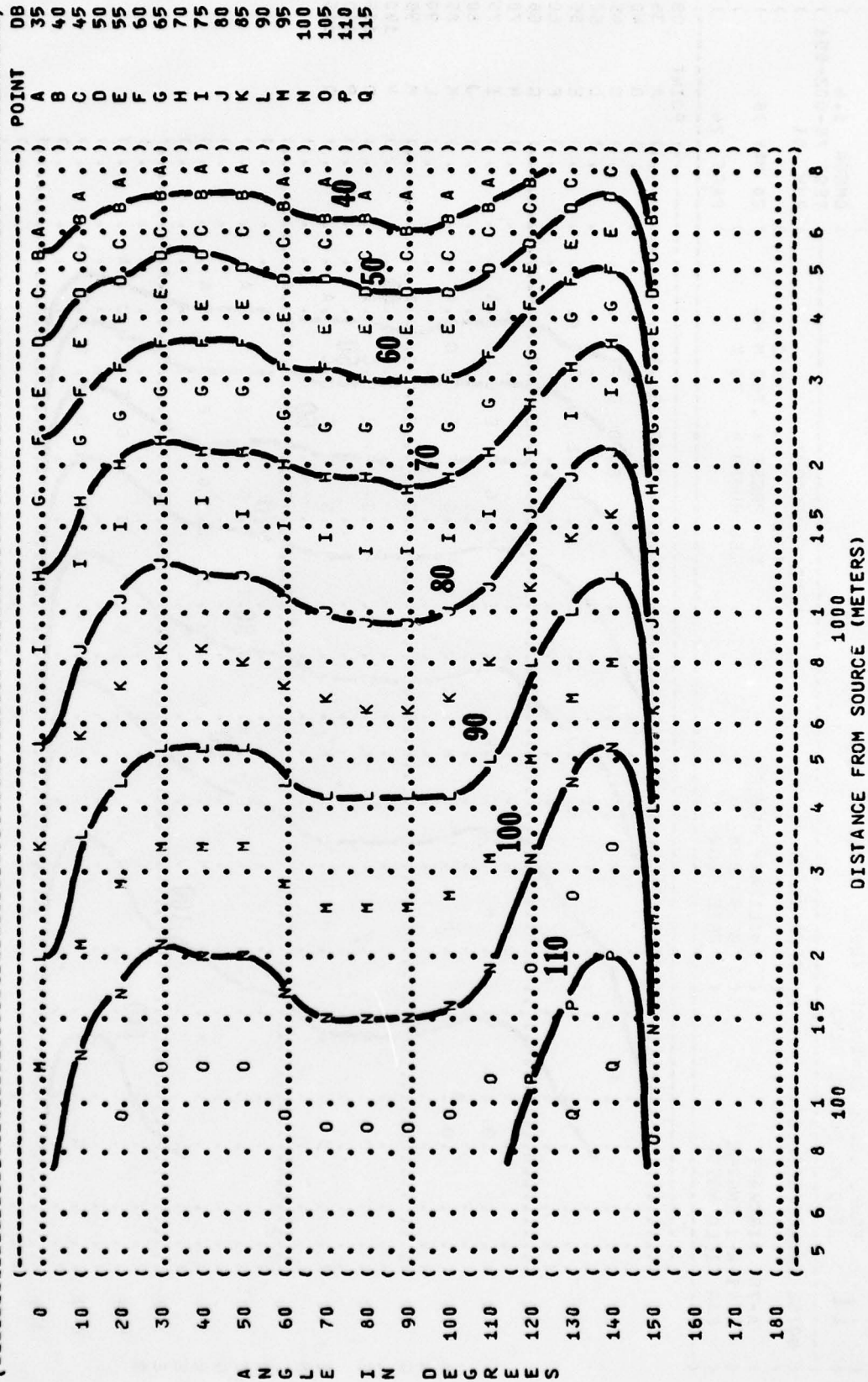


FIGURE#	SOUND PRESSURE LEVEL EQUAL LEVEL CONTOURS (DB)	IDENTIFICATION#
11	250 HZ OCTAVE BAND	OMEGA 1.4
		TEST 75-002-051
NOISE SOURCE/SUBJECT:	OPERATION:	RUN 01
		METEOROLOGY:
		TEMP = 15 C
A-7D AIRCRAFT	MILITARY POWER	BAR PRESS = .760 M HG
TF41-A-1 ENGINE	99.5% RPM	REL HUMID = 70 %
FAR FIELD NOISE	FREE FLOW	
		PAGE 21



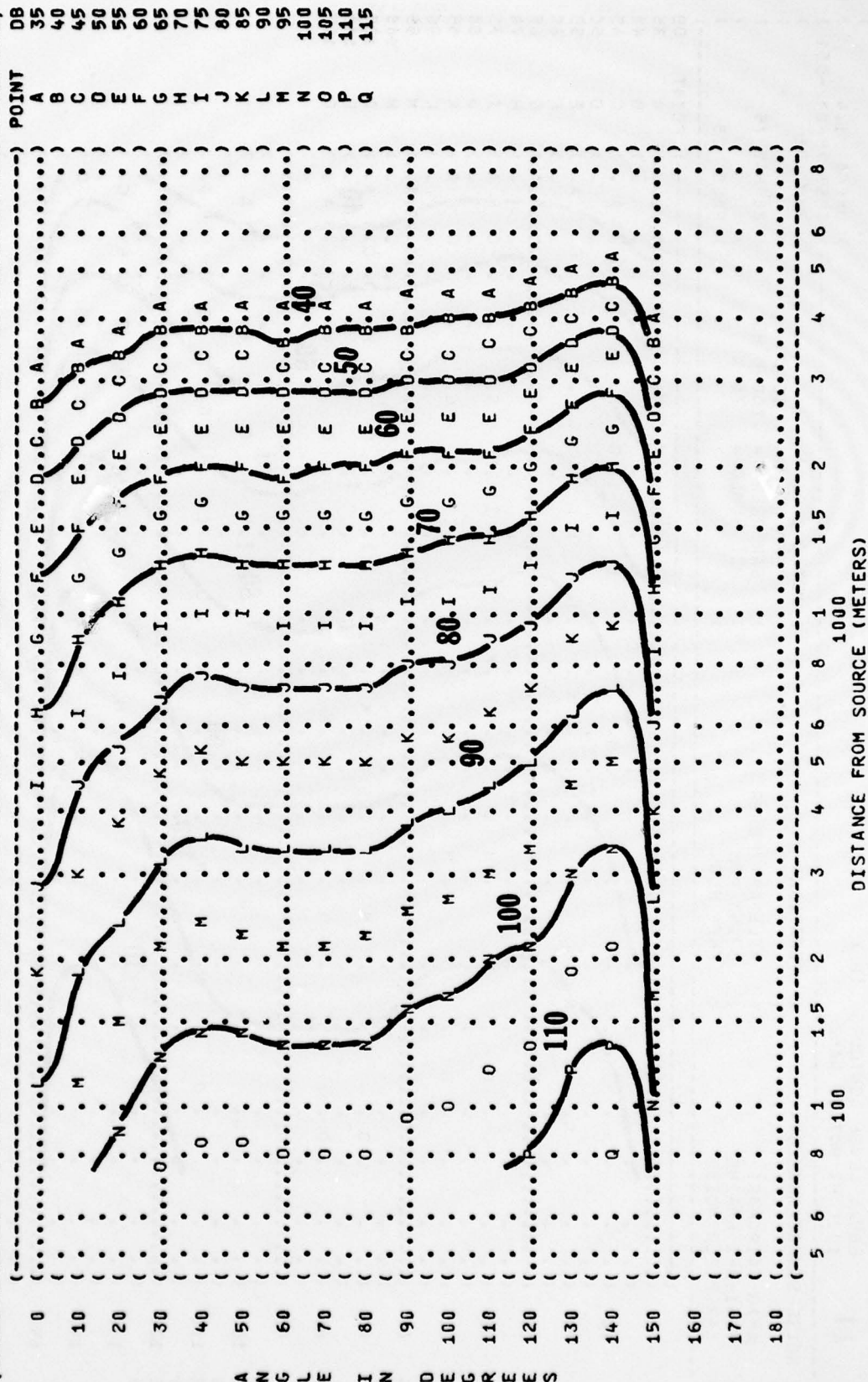
[illegible]

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(-----)
( FIGURE: SOUND PRESSURE LEVEL {SPL} ) IDENTIFICATION:
(      EQUAL LEVEL CONTOURS (DB) )
(      11 ) OMEGA 1.4
(      1000 HZ OCTAVE BAND ) TEST 75-002-051
( NOISE SOURCE/SUBJECT: ) RUN 01
( ) METEOROLOGY:
( ) TEMP = 15 C
( ) BAR PRESS = .760 M HG
( ) MILITARY POWER )
( ) 99.5% RPM )
( ) FREE FLOW )
( A-70 AIRCRAFT )
( TF41-A-1 ENGINE )
( FAR FIELD NOISE ) PAGE 23
(-----)
```



AZULJE IN DEGRADACIJA

(FIGURE: SOUND PRESSURE LEVEL (SPL)
 (EQUAL LEVEL CONTOURS (DB)
 (2000 HZ OCTAVE BAND
 (11
 (NOISE SOURCE/SUBJECT: (OPERATION:
 (((METEOROLOGY:
 (A-70 AIRCRAFT (TEMP = 15 C
 (TF41-A-1 ENGINE (MILITARY POWER (BAR PRESS = .760 M HG
 (FAR FIELD NOISE (99.5% RPM (REL HUMID = 70 %
 ((FREE FLOW ()
 () IDENTIFICATION:
 ()
 () OMEGA 1.4
 (TEST 75-002-051
 (RUN 01
 (20 MAY 75
 ()
 () PAGE 24
 ()



IDENTIFICATION:
OMEGA 1.4
TEST 75-002-05

(OPERATION:

(MILITARY POWER
(99.5% RPM
(FREE FLOW
(

TEMP = 15 C
BAR PRESS = .760 M HG
REL HUMID = 70 %

1000
DISTANCE FROM SOURCE (METERS)

420 LE HZ DECEMBER 5